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Name:

Signature:

James Porter  
James Porter  
Clifford Chance Rogers & Wells LLP

Docket No. 3499-92

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED

DEC 14 2001

Technology Center 2100

In re Application of: David Lawrence

Filed: December 6, 2001

Group Art Unit: 2163

Serial No: 09/812,628

Examiner: n/a

For: AUTOMATED ACCOUNT RISK MANAGEMENT

PETITION TO MAKE SPECIAL UNDER 37 C.F.R. § 1.102

U.S. Patent and Trademark Office  
P.O. Box 2327  
Arlington, VA 22202

Sir:

Pursuant to 37 C.F.R. § 1.102, and in accordance with section 708.02 XI the Manual of Patent Examining Procedure (MPEP), entitled Inventions for Countering Terrorism, applicants hereby respectfully request a Petition to Make Special for the above-identified patent application.

The above invention contributes to countering terrorism by allowing financial institutions and other organizations to automatically monitor information associated with account opening which can be critical to anti-terrorism in a timely and uniform fashion. Government and law enforcement agencies increasingly rely on "know-your-customer" diligence on the part of financial institutions in an effort to discover and interrupt terrorist activities. Current methods of researching parties related to account openings do not efficiently offer real time feed back indicative of a level of risk associated with the account. As a result, diligence conducted by large financial institutions, as well as others, is inefficient. What is needed is a method and system to expedite risk assessment to facilitate timely response to risk such as blocking an account opening and notifying an appropriate authority. High risk accounts that are blocked as a result of the present invention, or that are more closely monitored as a result of the present invention, will allow government and law enforcement agencies to better counter terrorist strategies and also enable financial institution's to manage risk associated with suspect accounts.

12/12/2001 SMINASS1 00000072 500521 09812628

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Application S/N 09/812,628

NYB 1302673.2

Petitioner presents all claims directed to a single invention, or if the Patent and Trademark Office (Office) determines that all of the claims are not obviously directed to a single invention, will make an election without traverse as a prerequisite to the grant of special status.

The following documents are enclosed in support of this Petition:

1. A copy of the above-identified application including all claims directed to a single invention.
2. A statement including a pre-examination search listing the field of search by class and subclass.
3. A copy of each reference deemed related to the subject matter encompassed by the claims of the above-identified application.
4. A detailed discussion of the references pointing out how the claimed subject matter is patentable over the references.

The Commissioner is hereby authorized to charge the required fee of \$130.00 for a Petition to Make Special as set forth in 37 C.F.R. § 1.17(i), or any additional fees, or to credit any overpayments in connection with this communication, to Deposit Account No. 50-0521. A duplicate copy of this Petition is enclosed herewith.

Accordingly, it is respectfully requested that the U.S. Patent and Trademark Office grant this Petition to Make Special for the above-identified application.

Date:

Dec. 6, 2001

Respectfully submitted,

J.P. Kincart

Joseph P. Kincart

Reg. No. 43,716

Clifford Chance Rogers & Wells LLP  
200 Park Avenue  
New York, NY 10166-0153  
Telephone: (212) 878-3218

## **STATEMENT OF FIELD OF SEARCH**

A pre-examination search for the above-identified application was conducted in Class 235/379; 235/380; 340/825.33, 705/36; 705/35.

## **DISCUSSION OF REFERENCES**

### **U.S. Patent 5,177,342 ('342)**

The '342 patent to Adams is entitled "Transaction Approval System," and issued on January 5, 1993. The '342 patent describes a transaction approval system for systems employing transaction cards, such as those used to make a purchase. It includes the ability to dynamically adjust such elements as the transaction limit stored in the terminal to vary the level of risk at the terminal to be closer to the desired level of risk. The terminal will also generate and store a list of account numbers which might be invalid and should provide an on-line request for authorization.

Although the '342 patent relates generally to containing financial risk through the use of an electronic system, it does not address the broader legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.

### **U.S. Patent 6,078,904 ('904)**

The '904 patent to Rebane is entitled "Risk Direct Asset Allocation and Risk Resolved Cap for Optimally Allocating Investment Assets in an Investment Portfolio," and issued on June 20, 2000. The '904 patent describes a computer implemented system for allocating an investor's funds wherein said system determines the risk tolerance function of the investor. The risk addressed in the '904 patent relates generally to financial risk associated with an investment and whether the financial risk is tolerable to the investor. The '904 patent does not address the broader legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.

### **U.S. Patent 6,085,175 ('175)**

The '175 patent to Gugel, et al. is entitled "System and Method for Determining Value at Risk of a Financial Portfolio," and issued on July 4, 2000. The '175 patent describes a system and method for analyzing financial risk data; in particular estimating value-at-risk (VAR) of a financial portfolio which includes an analysis of a distribution of sorted financial data samples to determine an accurate range of upper and lower limits of an expected value of VAR. The '175 patent does not address the broader legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.

### **U.S. Patent 6,119,103 ('103)**

The '103 patent to Basch, et al., entitled "Financial Risk Prediction Systems and Methods Therefor," and issued on September 12, 2000. The '103 patent describes a computer-implemented method for predicting financial risk, which includes receiving data pertaining to transactions performed on more than one financial account held by a given account holder and where each of the multiple accounts is issued by a different account issuer. The described method relates generally to scoring risk related to financial transactions by scoring of a first transaction data and a second transaction data based on a preexisting model to form a score for the account holder which is provided by the system. The '103 patent does not address the broader legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.

#### WO 01/55885 A2 ('885)

International publication date, August 2, 2001, entitled "Online sales Risk Management System", issued to Greener, et al., describes a computer-implemented method for providing risk management for online transactions. An exchange price for a foreign currency relative to a base currency is entered into a host computer which also receives data descriptive of one or more transactions involving the foreign currency that occurred within a predetermined time period. Currency is exchanged according to the entered price and the transaction amounts contained in the data. A risk exposure for the predetermined time period can be calculated. Transactions can include any quantifiable transaction such as an online sales transaction consummated over a computerized communications network. The risk exposure in the '885 patent relates to a financial risk associated with currency exchange, it does not address the broader legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.

#### WO 0075836 ('836)

International publication date, December 14, 2000, entitled "Portfolio Accounting and Risk Management System", issued to Coppola, describes a method and system for managing investment portfolio risk on a computer system. Data is stored on a computer-readable medium, along with an equity value associated with a user's portfolio. A point risk value is determined for a potential investment. Risk scenarios are displayed showing proposed numbers of shares or contracts associated with the point risk value for a plurality of selected size risk values. Other risk characteristics may also be determined and displayed. The system and method may be embodied in a client/server system or in a stand-alone computer system. The risk addressed by the '836 patent is financial risk associated with potential investment. A point risk value is disclosed, but not as it relates to legal, regulatory and reputational risks associated with opening a financial account. Nor does the point risk value provide an indicator of a level of risk associated with an existing particular account.

#### Non-Patent Literature References:

1. A website [www.paynetonline.com](http://www.paynetonline.com) includes references that describe an online, automated system for members to obtain reports of pooled financial information for their use in assessing risks associated with certain financial transactions. The service offered allows members to share payment history with other members. One benefit of the shared information may be the ability to better determine a credit risk associated with a potential lessor. The website does not provide for or otherwise disclose monitoring for the various types of risk, such as legal, regulatory and reputational risks associated with opening a financial account or provide an indicator of a level of risk associated with a particular account.
2. Banasiak, Michael; "Don't Be Out-Scored by Your Competition", Credit and Financial Management Review, 2<sup>nd</sup> Quarter 2000. This reference describes the benefits to be derived from an automated credit scoring model in conjunction with a validation process implemented with a knowledge-based decision making system. Although the article relates generally to automated risk scoring, it does not disclose automated analysis and risk scoring associated with legal, regulatory and reputational risks related to opening a financial account or provide an indicator of a level of risk associated with a particular account.

#### SUMMARY

None of the above references provides for or teaches a computer-implemented method for providing real time risk monitoring and analysis that relates to multiple types of risk. In particular, none of the above references teaches computerized monitoring of account opening. Similarly, it is not known

to provide computerized monitoring and risk scoring for legal, regulatory and reputational risks associated with opening a financial account.

Other aspects of the present invention that are novel include the ability to create a risk quotient based upon weighted risk quotient criteria and to calculate a rating of the total risk assumed by the organization. In addition it is unique to provide a suggested action based upon a risk quotient calculated according to weighted risk criteria.

Other embodiments of the present invention include a system and computer program for implementing the above methods.

**APPLICATION  
FOR  
UNITED STATES LETTERS PATENT**

**TITLE:**           **AUTOMATED ACCOUNT RISK MANAGEMENT**

**APPLICANT:**     **David Lawrence**

"EXPRESS MAIL" Mailing Label Number EL478577931US

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I hereby certify under 37 CFR 1.10 that this correspondence is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

James Porter

James Porter



## **AUTOMATED ACCOUNT RISK MANAGEMENT**

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### **BACKGROUND**

This invention relates generally to the identification, investigation, assessment and management of legal, regulatory and reputational risks ("Risks"). In particular, the present invention relates to a computerized system and method for structuring risk management models designed to assist a financial institution quantify financial, legal, regulatory and reputational risk associated with opening accounts related to management of financial assets and investments.

Bank and non-bank financial institutions, including: investment banks; merchant banks; commercial banks; securities firms, including broker dealers securities and commodities trading firms; asset management companies, hedge funds, mutual funds, credit rating funds, securities exchanges and bourses, institutional and individual investors, law firms, accounting firms, auditing firms and other entities, hereinafter collectively referred to as "financial institutions," typically have few resources available to them to assist in the identification of present or potential risks associated with opening a particular investment or trading account. Risk can be multifaceted and far reaching. Generally, personnel interfacing with a client have minimal understanding of the issues involved relating to risk. Nor do the personnel have available a mechanism to provide real time assistance to assess a risk factor or otherwise qualitatively manage risk. In the event of investment problems, it is often difficult to quantify to regulatory bodies, shareholders, newspapers and other interested parties, the diligence exercised by the financial institution to properly identify and respond to risk factors. Absent a means to quantify good business practices and diligent efforts to contain risk, a financial institution may appear to be negligent in some respect.

Risk associated with opening an investment account can include factors associated with financial risk, legal risk, regulatory risk, credit risk and reputational risk. Financial risk can include factors indicative of monetary costs that the financial institution may be exposed to as a

result of opening a particular account and/or transacting business with a particular client. Monetary costs can be related to fines, forfeitures, cost to defend an adverse position, or other related potential sources of expense. Credit risk relates to factors that can adversely affect a party's ability to borrow money. Regulatory risk can include factors that may cause the financial institution to be in violation of rules put forth by a regulatory agency such as the Securities and Exchange Commission (SEC), Federal Reserve Board, a stock exchange or international counterparts. Regulatory risk can be particularly important in light of ongoing increased scrutiny of business practices which can result in managerial distraction and loss of management time. Reputational risk relates to harm that a financial institution may suffer regarding its professional standing in the industry.

A financial institution can suffer from being associated with a situation that may be interpreted as contrary to an image of honest and forthright corporate governance. Detrimental effects can include a significant loss of business and client confidence.

What is needed is a method and system to assist in due diligence relating to opening accounts involved in financial transactions. A new method and system should anticipate offering guidance to personnel who interact with clients and also be situated to convey information relating to risk to a compliance department, and assist in prioritization and/or evaluation of how serious or important a situation may be. It should be able to demonstrate to regulators that a financial institution has met standards relating to risk containment.

### SUMMARY

Accordingly, the present invention provides a risk management method and system for facilitating analysis and quantification of risk. An automated account opening risk management system receives information quantifying factors relating to financial, legal, regulatory and/or reputational risk. The information is utilized to assess criteria relating to such factors and generate a risk quotient or other rating based upon weighted algorithm applied to the criteria. The risk quotient is indicative of risk associated with an account. The quotient can be monitored on account opening or during the course of transactions. A log or other stored history can be



created such that utilization of the system can mitigate adverse effects relating to a problematic account by demonstrating to regulatory bodies, shareholders, news media and other interested parties that corporate governance is being addressed through tangible risk management processes. An implementing institution may include, for example, a bank, a trading institution, an insurance company, a credit card issuer, a trading exchange, a government regulator or a law enforcement agency.

A computer can implement a method for managing risk related to a client account, the method can include receiving information relating to a client account and structuring the information received according to risk quotient criteria. A weight can be associated with the risk quotient criteria such that a risk quotient can be calculated utilizing the information structured according to risk quotient criteria and the associated risk quotient criteria. A suggested action responsive to the risk quotient and/or information received can be generated, as well as a due diligence report based upon data stored in a risk quotient criteria database. The suggested action is typically directed towards reducing risk associated with the client account, such as blocking the opening of an account or notifying an authority concerning information received.

Information can be received in a pre-structured format or structured to conform to a database after receipt. Stored data can include information received, a risk quotient and a suggested action. The due diligence report can include inquiries made relating to the account and actions taken responsive to the risk quotient.

A graphical user interface can be presented to a network access device and display questions. Input responsive to the questions can be received into the network access device. Information relating to the client account can also be received from an source of electronic data.

Risk assumed by a financial institution can be calculated as the risk is represented by the risk quotient, such as, for example, aggregating risk quotients in order to calculate a total risk assumed by a financial institution or calculating an average risk quotient associated with a transaction. A risk quotient can be calculated by multiplying a numerical value representative of a risk associated with a risk criteria times a numerical value indicative of a category weighting.

The present invention can also be embodied as a computerized system for managing risk associated with a client account, a computer executable program code residing on a computer-readable medium, or a computer data signal embodied in a digital data stream.

In another aspect, a computer system for providing risk management relating to opening accounts can include a computer server that is accessible with a network access device via a communications network; and executable software stored on the server and executable on demand via the network access device. The software operative with the server to can be utilized to receive information relating to risk management factors and formulate a risk quotient or rating.

Other embodiments can include a computer executable program code residing on a computer-readable medium or a computer data signal embodied in a digital data stream. Various features and embodiments are further described in the following figures, drawings and claims.

#### DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a block diagram which can embody this invention.

Fig. 2 illustrates a network on computer systems that can embody an enhanced online sales risk management system.

Fig. 3 illustrate a flow of exemplary steps that can be executed in practicing account risk management.

Fig. 4 illustrates an exemplary graphical user interface useful for gathering information according to the present invention.

Fig. 5 illustrates an alert presented via a graphical user interface.

#### DETAILED DESCRIPTION

The present invention includes a computerized method and system for managing risk associated with opening an account created for performing financial transactions. Information

relating to financial, legal, regulatory and/or reputational risk is input into a computer system. The computer system applies an algorithm that weights the input information and calculates a risk quotient or similar rating. The risk quotient can include a scaled numeric or alpha-numeric value.

If an account exceeds a risk quotient threshold, the system responds with a predetermined action. Actions can include, for example, blocking acceptance of an account, creating a report, generating an alert, notifying a compliance department, or other appropriate response. In addition, the system can create a structured history relating to a new account that can demonstrate due diligence and proper corporate governance. Reporting can be generated from the structured history.

Referring now to Fig. 1 a block diagram of one embodiment of the present invention is illustrated. An account opening entity 101, such as a sales representative or a programmable robot, supplies information into an Account Risk Management System (ARM) 102. The information can be responsive to a predetermined set of questions. In one embodiment, questions or other prompts can be viewed on a graphical user interface (GUI) and in turn ask a client, such as an account opener, appropriate questions during an account opening interview. In the case of an automated account opening, such as for example, opening an online account, questions can be presented to the account opener by a programmable robot via a GUI. Questions can relate to a particular type of account, a particular type of client, types of investment, or other criteria. In addition, the questions can depend upon previous answers. Information received in response to the questions can be input into the ARM 102 and utilized for real time risk assessment and generation of a risk quotient 103.

The risk assessment and risk quotient 103 can subsequently be made available to an account opening entity 101 in real time and provide guidance on a suggested next step for the account opening entity 101 to take, or notify an additional party regarding the risk assessment and suggested next steps.

A history, log, or other stored history can capture questions considered by the account opening institution. In addition, information gathered, steps taken and other due diligence can be compiled by the ARM 102. Such quantification can be utilized for presentation to regulatory bodies, shareholders, news media and/or other interested parties to mitigate adverse effects

relating to a problematic account. The history can demonstrate that corporate governance is being addressed through tangible risk management processes.

The risk quotient 103 can also be used to perform calculations on risk experienced by the account holding institution as represented by the risk quotient. For example, an aggregate, sum, mean, or other calculation can be made according to the risk quotients relating to account risk. In this manner, an institution can analyze risk according to an algorithm such as an average or mean risk assumed by the institution, its branch locations or a particular client representative. In addition, the ARM 102 can aggregate risk 105 according to the risk quotient 103 and calculate a total risk assumed by the financed institution.

Referring now to Fig. 2, a network diagram illustrating one embodiment of the present invention is shown. An automated account risk management system can include an ARM System 210 accessible via a distributed network 201 such as the Internet, or a private network. A client 220-222, regulatory entity 226, corporate compliance 228 or other party interested in account management can use a computerized system or network access device 204-208 to receive, input, transmit or view information processed in the ARM system 210. A protocol, such as the transmission control protocol internet protocol TCP/IP can be utilized to provide consistency and reliability.

Each of the network access devices can include a processor, memory and a user input device, such as a keyboard and/or mouse, and a user output device, such as a display screen and/or printer. The network access devices 204-208 can communicate with the ARM system 210 to access data stored at the ARM system 210. The network access device 204-208 may interact with the host computer 250 as if the host was a single entity in the network 200. However, the ARM system 210 may include multiple processing and database sub-systems, such as cooperative or redundant processing and/or database servers, that can be geographically dispersed throughout the network 201. In some implementations, groups of network access devices 204-208 may communicate with ARM system 210 through a local area network.

The ARM system 210 includes one or more databases 202 storing data relating to account opening. The ARM system 210 may interact with, and/or gather data from a client 220-222, regulatory entity 226, corporate compliance 228, account opening personnel 223-224 or other

person who is operating a network access device 204-208. Data gathered from an operator may be structured according to risk criteria and utilized to calculate a risk quotient.

Typically a user will access the ARM system 210 using client software executed at a network access device 204-208. The client software may include a generic hypertext markup language (HTML) browser, such as Netscape Navigator or Microsoft Internet Explorer, (a "WEB browser"). The client software may also be a proprietary browser, and/or other host access software. In some cases, an executable program, such as a Java™ program, may be downloaded from the ARM system 210 to the client computer and executed at the client computer as part of the ARM system software. Other implementations include proprietary software installed from a computer readable medium, such as a CD ROM. The invention may therefore be implemented in digital electronic circuitry, computer hardware, firmware, software, or in combinations of the above. Apparatus of the invention may be implemented in a computer program product tangibly embodied in a machine-readable storage device for execution by a programmable processor; and method steps of the invention may be performed by a programmable processor executing a program of instructions to perform functions of the invention by operating on input data and generating output.

Referring now to Fig. 3, managing risk associated with opening an account related to financial transactions can begin with opening a dialogue with an ARM system 310. Typically, the dialogue would be opened by presenting a GUI to a network access device accessible by person who will enter information relating to the account opener. The GUI will be capable of accepting data input via the network access device. An example of an GUI would include a series of questions relating to the client seeking to open the account. The questions can be displayed on a GUI referenced in an account opening interview with a sales person or clerk, or answered via an online form. In the event of an account opening interview with a sales person, the sales person can, in turn, enter the information received orally into an online form.

Alternatively, a dialogue can also be opened with a source of electronic data such as an external database or messaging system, including a live data feed of market data or news, a commercial database service, or a subsidiary office. In either case, the dialogue will enable the ARM system 102 to receive data relating to the client account 311.

The ARM system 102 can structure the information received according to defined risk quotient criteria 312 and a weighted score. Structuring information can include allocating it to an appropriate data field in an associated database. For example, information received can include what type of account is being opened. Types of accounts to be opened may include: an individual account, a public company domiciled in a G-7 country or Hong Kong; a public company not domiciled in a G-7 country or Hong Kong, a corporate account regulated by a G-7 agency or a corporate account regulated by a non G-7 government agency; a private company or partnership, a holding company, an intermediary managed account such as a money manager or hedge fund, a trust or foundation, or other type of legal entity or financial institution as defined above. Weighted scores can correlate to the importance of the data field.

In one embodiment, the ARM system can receive the information in a pre-structured format. Pre-structuring can be accomplished for example by a network access device 204-208 or a source of electronic data. The pre-structured data can have information received associated with, and formatted for, a destination field in a risk criteria database 202. Receiving the information in a pre-structured format allows the ARM system 102 to proceed with calculating a risk quotient 313 without having to further structure the information.

Calculating a risk quotient can be accomplished by assigning a numerical value representative of a risk associated with a particular piece of information. Values for the criteria can be assigned according to their potential risk. For example, it may be determined that a public company in a G-7 country poses minimal risk, therefore this information is assigned a low numerical value, or even a negative numerical value. Similarly, a corporate holding company may be viewed as indicative of a high risk and information conveying this may be assigned a high numerical value. Data points and/or responses received may have independent and/or dependant correlation with an overall risk quotient. In addition, a weight can be assigned to the risk category to which the information is assigned according to the relative importance of the data the category holds. In addition, a weight to one data field can be modified in response to a value entered into a related field. A criteria score can be calculated by multiplying the numerical value representative of the risk associated with a risk criteria times the category weighting.

For example, information received may indicate the ownership structure of a company is a public entity. A public entity may receive a numerical value of  $-5$  because it is a relatively low risk ownership structure. In addition, this information may be included in a Company Profile category, wherein the Company Profile is assigned a category weighting of 3. Therefore, the net score for this information is  $-5$  times 3 or  $-15$ . All scores within the Company Profile are summed to calculate a weighted risk score. Weighted risk scores from all associated categories are summed to calculate a total weighted risk score, or Risk Quotient.

A suggested action can be generated that is responsive to the Risk Quotient 314. For example, in response to a high risk score, a suggested action may be to cancel the account or even to notify an authority. In response to a low risk score, the ARM system 102 may respond by opening the account. Intermediate scores may respond by suggesting that additional information be gathered, or that transactions for this account be monitored.

The ARM system 102 can also store, or otherwise archive ARM data and proceedings. For example the ARM system 102 can store information received, and also generate a Risk Quotient and suggested actions to be taken 315. This information can be useful to quantify corporate governance and diligent efforts to address high risk situations. Accordingly, reports quantifying the risk management procedures, executed due diligence, corporate governance or other matters can be generated 316.

Referring now to Fig. 4, an exemplary GUI for receiving information is illustrated 400. The GUI can include areas prompting for information, such as in the form of a question 413 and appropriate responses 414. A programmable user interactive device, such as a checkbox, X field, yes/no field or other device can be utilized to indicate an answer, or otherwise input information 415. A category weighting 410 can also be indicated on the GUI. Typically the weighting will be predetermined. However, if desired the weighting can be modified by a user. The receiving information GUI 400 can also include areas for displaying a response value 411 and a response score for the inquiry 412.

As illustrated in Fig. 5, an alert can be generated to be displayed on a GUI 500 in response to risk quotient value. For example, if a risk quotient indicates a high risk, an alert box

501 can be displayed over normal GUI content 502. Other forms of alerts, including an e-mail, a log, a textual report or limitation of available investment actions can also be utilized.

A number of embodiments of the present invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, network access devices 204-208 can comprise a personal computer executing an operating system such as Microsoft Windows™, Unix™, or Apple Mac OS™, as well as software applications, such as a JAVA program or a web browser. network access devices 204-208 can also be a terminal device, a palm-type computer, mobile WEB access device, a TV WEB browser or other device that can adhere to a point-to-point or network communication protocol such as the Internet protocol. Computers and network access devices can include a processor, RAM and/or ROM memory, a display capability, an input device and hard disk or other relatively permanent storage. Accordingly, other embodiments are within the scope of the following claims.



CLAIMS

What is claimed is:

1. A computer-implemented method for managing risk related to a client account, the method comprising:  
receiving information relating to a client account;  
structuring the information received according to risk quotient criteria;  
associating a weight to the risk quotient criteria;  
calculating a risk quotient utilizing the information structured according to risk quotient criteria and the associated risk quotient criteria; and  
generating a suggested action responsive to the risk quotient.
2. The method of claim 1 additionally comprising the steps of:  
storing data in a risk quotient criteria database, wherein the stored data includes the information received, the risk quotient and the suggested action; and  
generating a due diligence report based upon the stored data.
3. The method of claim 2 wherein the due diligence report comprises inquiries made relating to the account and actions taken responsive to the risk quotient.
4. The method of claim 1 additionally comprising the steps of:  
presenting a graphical user interface to a network access device;  
displaying questions on the graphical user interface; and  
receiving the information relating to the client account responsive to the questions displayed.
5. The method of claim 1 wherein the information relating to the client account is received from an source of electronic data.
6. The method of claim 1 wherein the suggested action is additionally responsive to the information received.
7. The method of claim 1 wherein the suggested actions are directed towards reducing risk associated with the client account.
8. The method of claim 1 wherein the suggested action comprises blocking acceptance of an account.

9. The method of claim 1 wherein the suggested action comprises notifying an authority concerning information received.
10. The method of claim 1 wherein the information received is received electronically from an external database.
11. The method of claim 1 additionally comprising the step of performing a calculation on the risk assumed by a financial institution as represented by the risk quotient.
12. The method of claim 11 wherein the calculation comprises aggregating risk quotients in order to calculate a total risk assumed by a financial institution.
13. The method of claim 11 wherein the calculation comprises calculating an average risk quotient associated with a transaction.
14. The method of claim 1 wherein the information is received in a pre-structured format.
15. The method of claim 1 wherein the risk quotient is calculated by multiplying a numerical value representative of a risk associated with a risk criteria times a numerical value indicative of a category weighting.
16. A computerized system for managing risk associated with a client account, the system comprising:
  - a computer server accessible with a network access device via a communications network; and
  - executable software stored on the server and executable on demand, the software operative with the server to cause the system to:
    - receive information relating to a client account;
    - structure the information received according to risk quotient criteria;
    - associate a weight to the risk quotient criteria;
    - calculate a risk quotient utilizing the information structured according to risk quotient criteria and the associated risk quotient criteria; and
    - generate a suggested action responsive to the risk quotient.
17. The computerized system of claim 16 wherein the software is additionally operative to cause the system to:

store data in a risk quotient criteria database, wherein the stored data includes the information received, the risk quotient and the suggested action; and  
generate a due diligence report based upon the stored data.

18. The computerized system of claim 16 wherein the network access device is a personal computer.
19. The computerized system of claim 16 wherein the network access device is a wireless handheld device.
20. Computer executable program code residing on a computer-readable medium, the program code comprising instructions for causing the computer to:  
receive information relating to a client account;  
structure the information received according to risk quotient criteria;  
associate a weight to the risk quotient criteria;  
calculate a risk quotient utilizing the information structured according to risk quotient criteria and the associated risk quotient criteria; and  
generate a suggested action responsive to the risk quotient.
21. A computer data signal embodied in a digital data stream comprising data relating to risk management, wherein the computer data signal is generated by a method comprising the steps of:  
receiving information relating to political exposure associated with a person involved in a financial transaction;  
structuring the information received according to political exposure risk quotient criteria;  
and  
calculating a risk quotient using the structured information.
22. A method of interacting with a network access device so as to manage risk relating to political exposure associated with a financial transaction, the method comprising the steps of:  
receiving information relating to a client account;  
structuring the information received according to risk quotient criteria;  
associating a weight to the risk quotient criteria;

calculating a risk quotient utilizing the information structured according to risk quotient criteria and the associated risk quotient criteria; and  
generating a suggested action responsive to the risk quotient.

ABSTRACT

A computerized system and method for structuring risk management and assist a financial institution quantify financial, legal, regulatory and reputational risk associated with opening accounts related to management of financial assets and investments and facilitate analysis and quantification of risk. An automated account opening risk management system receives information quantifying factors relating to financial, legal, regulatory and/or reputational risk. The information is utilized to generate a risk quotient or other rating based upon a weighting algorithm applied to the criteria. The risk quotient is indicative of risk associated with an account. The quotient can be monitored on account opening, periodically or during a transaction. A log or other stored history can be created to help mitigate adverse effects relating to a problematic account by demonstrating to regulatory bodies, shareholders, news media and other interested parties that corporate governance is being addressed through tangible risk management processes. r

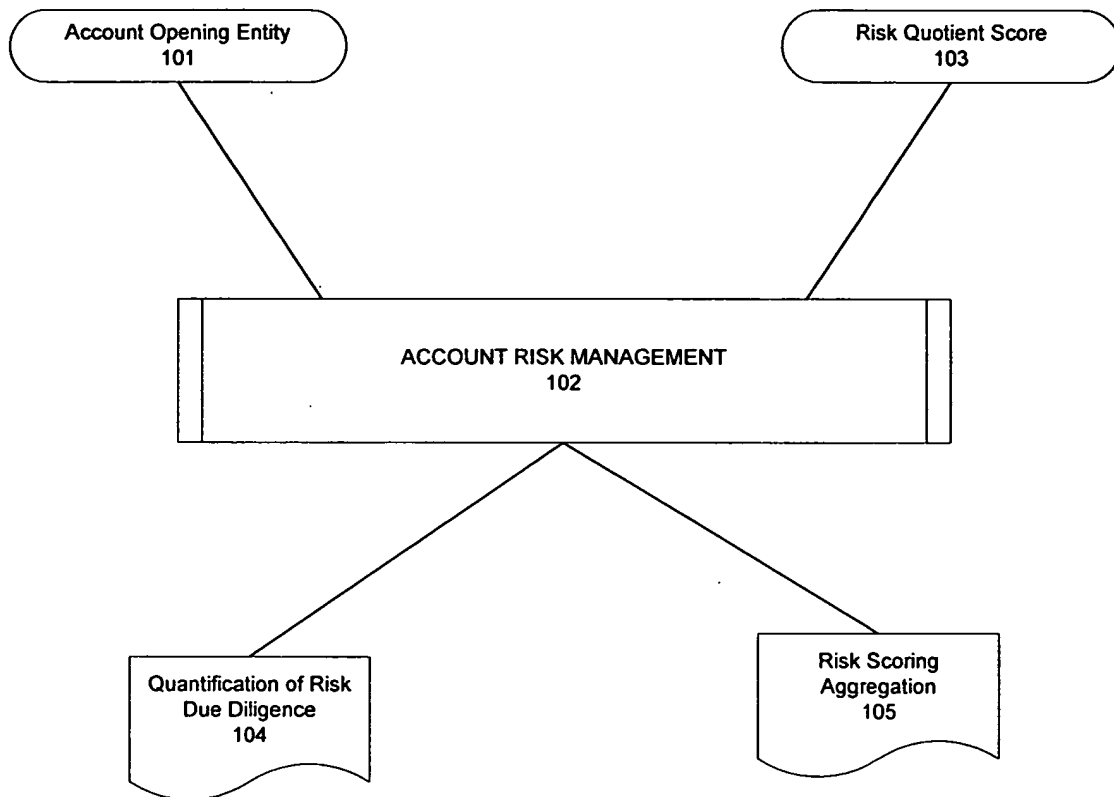


Fig. 1

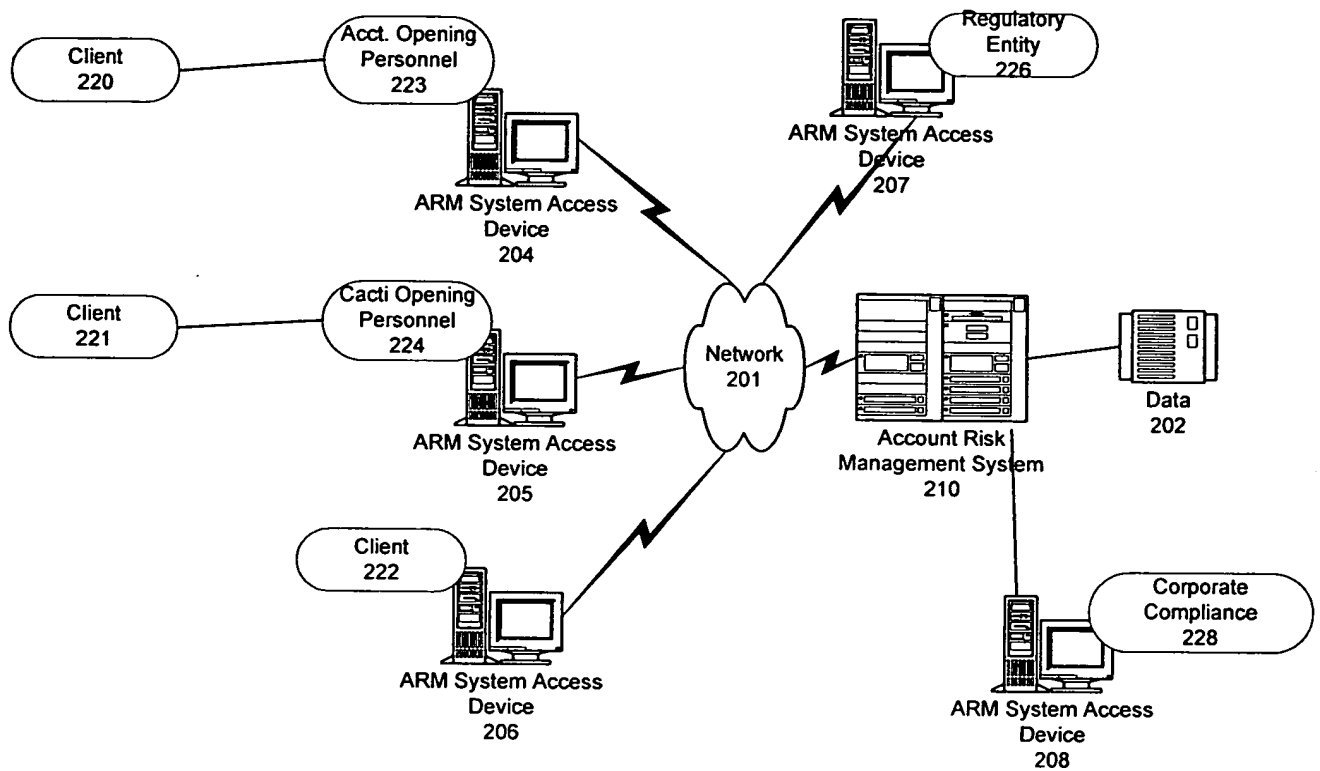


Fig. 2

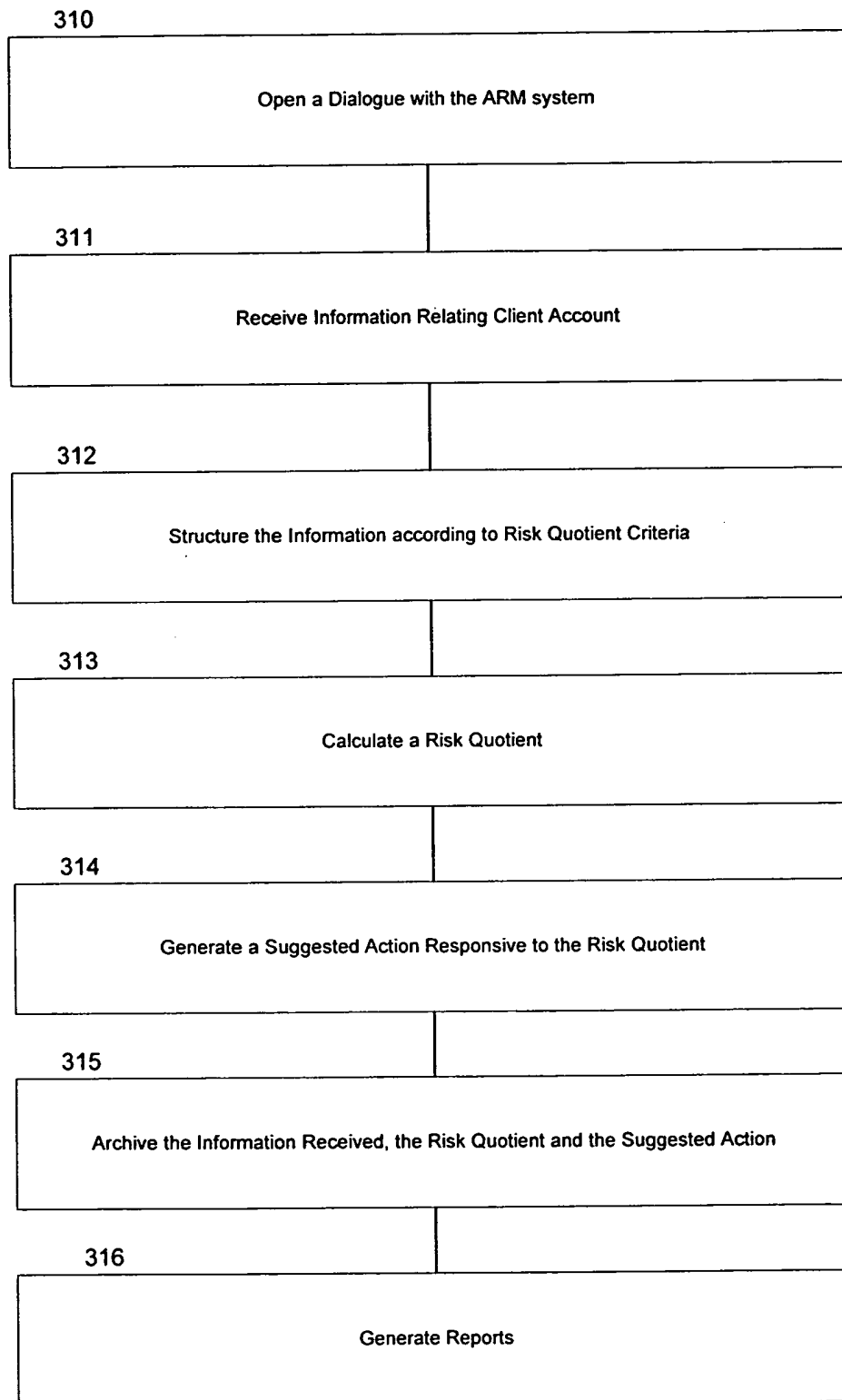
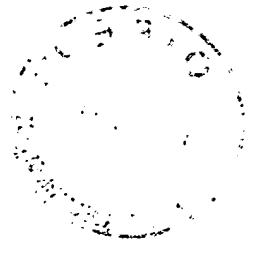


Fig. 3





400

410

411

412

| Category Weighting (0 to 10):                           |                              |   | 3 |  | Response Value | Response Score |
|---|------------------------------|---|---|--|----------------|----------------|
| 1. What is the ownership structure of the company?      | Public entity                |   |   | Mark box with "X" to indicate selected response. | -5             | 0              |
|   | Private entity               | X |   |  | 5              | 5              |
|   | Government entity            |   |   |  | 0              | 0              |
| 2. Where does the company maintain its head office?     | United States / Canada       | X |   |  | 0              | 0              |
|   | Latin / South America        |   |   |  | 5              | 0              |
|   | Western Europe               |   |   |  | 0              | 0              |
|   | Eastern Europe               |   |   |  | 7              | 0              |
|   | Russian Federation           |   |   |  | 10             | 0              |
|   | Middle East                  |   |   |  | 7              | 0              |
|   | Africa                       |   |   |  | 7              | 0              |
|   | South Asia                   |   |   |  | 5              | 0              |
|   | Japan                        |   |   |  | 2              | 0              |
|   | Southeast Asia               |   |   |  | 5              | 0              |
| Australia / New Zealand                                 |                              |   | 0 |  | 0              |                |
| 3. In what industry does the company generally operate? | Communications Services      | X |   |  | 5              | 5              |
|   | Consumer Products / Services |   |   | 3  | 0              |                |
|   | Financial Services           |   |   | 3  | 0              |                |
|   | Healthcare                   |   |   | 5  | 0              |                |
|   | Industrial Equipment         |   |   | 3  | 0              |                |
|   | Natural Resources            |   |   | 8  | 0              |                |
|   | Technology                   |   |   | 8  | 0              |                |
|   | Transportation               |   |   | 3  | 0              |                |
|   | Utilities                    |   |   | 0  | 0              |                |

415

413

414

Fig. 4

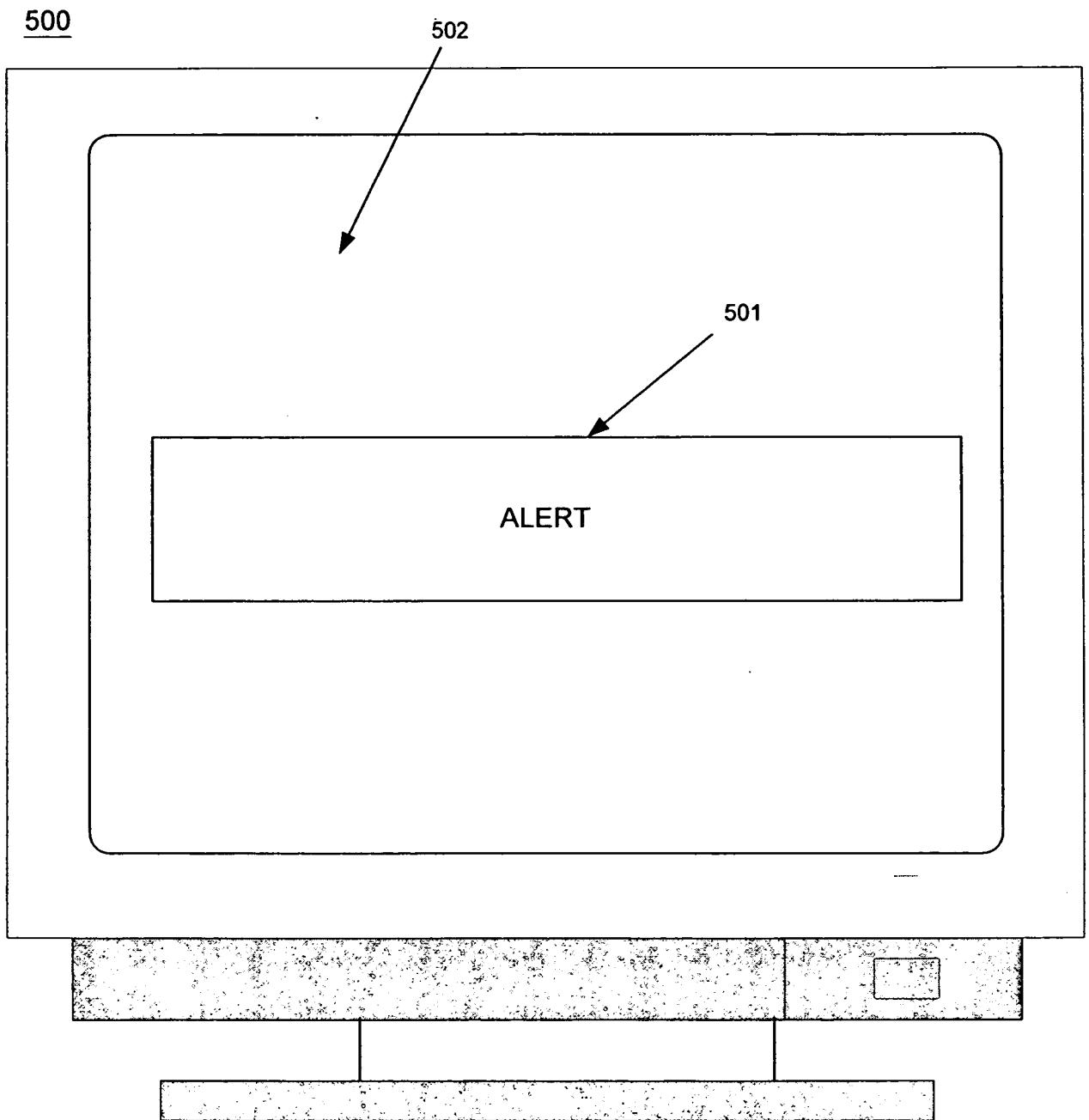


Fig. 5

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(71) Applicant (*for all designated States except US*): GOLD-  
MAN, SACHS & CO. [US/US]; One New York Plaza,  
New York, NY 10004 (US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): MANCINI, Robert,  
S. [US/US]; 632 Guardhill Road, Bedford, NY 10506  
(US). ROTHMAN, Daniel, J. [US/US]; 43 Crosby Street,  
New York, NY 10012 (US). HIGGINS, Mark [US/US];  
Apartment 3B, 45 West 60th Street, New York, NY 10023  
(US). GODFREY, John, Henry [US/US]; Apartment  
302, 421 Hudson Street, New York, NY 10014 (US).  
YOUNG, Paul, M. [US/US]; 201 E. 86th Street #19B,  
New York, NY 10028 (US). GUNWARDENA, Arun,  
M. [LK/US]; Apartment 5A, 422 East 72nd Street, New

York, NY 10021 (US). GREENER, Sharon [GB/US];  
126 Rumson Road, Rumson, NJ 07760 (US). ANAGNOS-  
TOPOULOS, Effie, Konstantine [US/US]; Apartment  
2RW, 515 West 48th Street, New York, NY 10036 (US).

(74) Agent: KINCART, Joseph, P.; Clifford Chance Rogers &  
Wells LLP, 200 Park Avenue, New York, NY 10166 (US).

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(54) Title: ONLINE SALES RISK MANAGEMENT SYSTEM

(57) Abstract: A computer-implemented method for providing risk management for online transactions. An exchange price for a foreign currency relative to a base currency is entered into a host computer. The host computer will also receive data descriptive of one or more transactions involving the foreign currency that occurred within a predetermined time period. The data will include a transaction amount. Currency is exchanged according to the entered price and the transaction amounts contained in the data. A risk exposure for the predetermined time period can be calculated based upon an aggregate amount of currency involved in transactions during the predetermined time period. The risk exposure can be based upon market data relating to the price of the foreign currency. The present invention can be implemented to capture each transaction amount that relates to a sale occurring on an e-commerce site. Currency is automatically exchanged at the price entered for the local currency. Transactions can include an online sales transaction consummated over a computerized communications network, a retail transaction between a business and a retail customer, a business to business transaction, an online auction transaction or any other quantifiable transaction.

## ONLINE SALES RISK MANAGEMENT SYSTEM

### CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of provisional application entitled "Retail System Currency Exchange," filed January 31, 2000, bearing the Serial No. 60/179,373 the contents of which are relied upon and incorporated by reference.

### BACKGROUND

The present invention relates generally to an on-line sales system. In particular, the present invention relates to a method-end system for managing risk associated with transacting commerce in locales utilizing different currencies.

The burgeoning use of the internet or other dispersed computer communications networks has created a surge in on-line sales transactions. Presently it is most common for an on-line retailer or other sales agent to conduct sales in one country with one currency risk. Few of these retailers are prepared to manage currency risk or offer their products in multiple currencies. Consequently, when they offer their product to consumers around the world, the consumers are required to pay in the retailer's local currency. It would be useful to have a product which will enable retailers or other business agents to offer prices in a variety of currencies.

As retailers or other sales agents expand to a global market spanning several countries, the sales agents will be presented with the risks associated with fluctuating currency prices. Typically, most e-commerce businesses are not well situated to adequately manage such currency risks.

Presently, credit card issuers including, for example, banks or corporate entities offer conversions for different currencies used to make an on-line sale. However, credit card arrangements do not lock in a currency price for a given period of time sufficient to enable an e-commerce retailer to sufficiently predict the impact of foreign currency exchange. In addition, a credit card issuer typically demands a relatively wide price difference for a currency exchange service, as compared to a market spot price.

It would be useful, therefore, to have a mechanism that allows an e-commerce sales agent to limit risk associated with currency exchange and also predict for a predetermined amount of time a currency price. In addition, it would be beneficial for an e-commerce sales agent to be able to negotiate a currency price based upon a projected sales volume/sales history and market data.

### SUMMARY

Accordingly, the present invention provides a method and system to implement a predetermined currency price for sales which are transacted within a predetermined time period. The current invention provides for a continued risk assessment either in real time, at specified time intervals, or upon demand. A computerized communications network is used to input market data relating to a currency involved as well as sales volume transacted in that currency to calculate a current risk exposure.

Currency price can be determined with a projected sales volume as well as market data. Sales volume can be calculated, for example, by extrapolating current sales data. In addition, a currency price can be negotiated using a step model wherein a currency price is determined based upon actual sales. For example, a first currency price can be available when an aggregated sales amount total falls within a first step of between \$0 and \$10,000. A second currency price can be available when the sum of the aggregated sales falls within \$10,001 to \$100,000. Still another currency price is available for the step ranging from \$100,000 to \$1,000,000, etc. An electronic sales agent (e-commerce participant) can thereby be better positioned to offer a consumer competitive pricing by zeroing out the e-commerce participant's exposure to changes in currency price. In addition, the e-commerce participant and the consumer are insulated from fluctuations in a currency price.

Additionally, the present invention provides a powerful marketing tool to an electronic retailer or other sales agent. The e-commerce participant can give customers around the world a choice of currency with which the customer can consummate a transaction with, whereby the consumer is better enabled to access local markets globally. In addition, the sales agent can make a 'virtual local site,' wherein they can build a version of their online site in a local language, customized to local tastes, with all product offerings in local currency. Online sites can include for example a web site on the Internet, or an address on a proprietary network.

A retailer or other sales agent is allowed to dynamically and transparently hedge currency risk as transactions occur. A given spot price can be maintained for a predetermined period of time, for example, one week or one month. As an e-commerce participant transacts business over the course of a predetermined time period, they can inform the financial institution, thereby allowing continually updating a notional amount of trade. At the end of the predetermined time period, the total notional can be settled normally.

A close relationship between a currency exchange institution and a client is created as an e-commerce participant. An e-buyer or e-seller can give the currency exchange institution information about their historical sales patterns to determine an expected volatility and volume of transactions. In addition, the present invention can utilize direct interfaces between the system of the currency exchange institution and the e-commerce participant in order to track transactions.

The present invention includes a computer-implemented method for providing risk management for online transactions. An exchange price for a foreign currency relative to a base currency is entered into a computer. The host computer will also receive data descriptive of one or more transactions involving the foreign currency that occurred within a predetermined time period. The data will include a transaction amount. Currency is exchanged according to the entered price and the transaction amounts contained in the data. A risk exposure for the predetermined time period can be calculated based upon an aggregate amount of currency involved in transactions during the predetermined time period. The risk exposure can be based upon market data relating to the price of the foreign currency.

The present invention can be implemented to capture each transaction amount that relates to a sale occurring on an e-commerce site. Currency is automatically exchanged at the price entered for the local currency. Transactions can include an online sales transaction consummated over a network, such as a computerized communications, a retail transaction between a business and a retail customer, a business to business transaction, an online auction transaction or any other quantifiable transaction.

In one aspect of the present invention, a spot price can be derived from the market at the time of the transaction. Another aspect allows for calculating an expected average amount of base and foreign currency to exchange and entering a forward

contract to the end of predetermined time period to buy a base currency and sell a foreign currency for a quantity equal to the expected average amount. Transaction amounts relating to multiple transactions can also be aggregated such that currency can be exchanged according to the entered price in an amount equal to the aggregate amount. If desired, the aggregate amount to be transacted during the predetermined time period can be limited in size.

In addition, a change in spot price of the foreign currency can be limited wherein the exchange price can be changed if spot price exceeds the limit. Alternatively, an amount can be set aside which will not be exchanged from the foreign currency to the base currency. The amount set aside can be used to cover local costs related to the business at hand.

In another aspect of the invention, a transaction can occur within a brick and mortar type retail setting or financial institutional setting.

This invention can also be embodied as a computer communications system utilizing executable software stored on a server and executable on demand via the network access device or a computer executable program code residing on a computer-readable medium.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Implementations can provide advantages such as real time calculation of risk exposure, continued risk assessment, planning capabilities for specified time period, removal of effects of currency fluctuation from consumer and e-commerce participant. A customer can record a price and be assured that the recorded price will remain available for a predetermined time period allowed for the currency exchange rate. Other features, objects, and advantages of the invention will be apparent from the description, the drawings and the claims.

#### DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates the components of a computer network system which can embody this invention.

Fig. 2 is an exemplary flow of a method including a predetermined price.

Fig. 3 illustrates a block diagram of the information exchange.

Fig. 4a is a block diagram illustrating a seller oriented embodiment of the invention.

Fig. 4b is a block diagram illustrating a buyer oriented embodiment of the invention.

Fig. 5 is an exemplary flow of a method including bid fulfillment.

Fig. 6 illustrates an exemplary interface displaying bids.

Fig. 7 illustrates an exemplary interface with originator and bidder information.

#### DETAILED DESCRIPTION

A currency exchange provider, or other institution that provides the service of exchanging currency, can facilitate the management of risk associated with conducting business in multiple currencies. Risk can be managed with market based pricing or with a predetermined currency pricing service. Generally, access to the risk management services is transparent to a buyer and a seller involved in an online transaction. Typically, a transaction will be consummated via a communications network by participants operating a network access device, such as a computer. In one embodiment, the present invention enables a participant in a transaction to record a price and be assured that the recorded price will remain available for the predetermined time period allowed for the currency exchange rate, thereby insulating the price from market fluctuations associated with currency exchange.

Risk management can be afforded for online or "e-commerce" transactions as well as for traditional paper based, or brick and mortar type transactions. A buyer can be a person or an entity such as, for example, a corporation or limited liability company seeking to purchase a good or service. An e-buyer is a buyer seeking to consummate a purchase via a computerized communications network, such as the Internet, or World Wide Web. Similarly, a seller can also be a person or an entity such as, for example, a corporation or limited liability company. A seller is offering a good or service. An e-seller is a seller seeking to consummate a sale via a computerized communications network, such as the Internet, or World Wide Web. Often the same person or entity can act in the capacity as both a buyer or a seller. Therefore a commerce participant is a person or entity which may act as either buyer or a seller. An e-commerce participant is a person or entity that can act in the capacity as both a buyer or a seller that seeks to consummate a transaction via computerized communications network. A customer will typically refer to a retail customer, and a client will typically refer to a person or entity that utilizes the services of a currency exchange institution.



Fig. 1 shows a network of computers 100 that may be used in an implementation of an on-line sales risk management system. The network 100 can include a host system 150 and e-commerce participant computers 101-106. Each of the e-commerce participant computers includes a processor, memory, a user input device, such as a keyboard and/or mouse, and a user output device, such as a video display, flat panel display and/or a printer. The e-commerce participant computers 101-106 can communicate with the host 150 to exchange transaction information. The transaction information can be stored as data on a storage medium 145 at the host 150. In addition, a commerce participant 131-136 operating an e-commerce participant computer 101-106 may complete an online financial transaction. The online transaction can be effected with a host computer 150, or details of the online financial transaction can be transmitted to a host computer 150.

Typically, a host computer will be supported by an e-commerce participant or a financial institution. The host 150 may include multiple processing and database subsystems, such as cooperative or redundant processing and/or database servers, which can be geographically dispersed throughout the network 100. In some implementations, groups of e-commerce participant computers 105-106 may communicate with a host 150 through a local network 156. The local network 155 can also include a local server such as a proxy server or a caching server.

The host computer 150 includes one or more databases 145 storing financial transaction information and e-commerce applications. A large variety of e-commerce related files may be stored at the host 150; for example, text, audio, video, graphics, animations, and illustrations. In addition, the host 150 may interact with, and gather data from a commerce participant via an e-commerce participant computer 101-106. Data gathered from the commerce participant may be used to conduct e-commerce and/or to project future sales.

A customer can access the host 150 using software executed at an e-commerce participant's computer 101-106. The software may include a generic hypertext markup language (HTML) browser, such as Netscape Navigator or Microsoft Internet Explorer, (a "WEB browser"). The software may also be a proprietary browser, and/or other host access software. In some cases, an executable program, such as a Java™ program, may be downloaded from the host 150 to the e-commerce participant computer and executed at the e-commerce participant computer as part of the e-commerce transaction.

In general, the host computer 150 will communicate with a Currency Exchange System 107. The currency exchange system 107 will log transaction data relating to sales, or other type, of financial transaction. The currency exchange can provide a market price, or a predetermined currency price which has been programmed for a predetermined time period. In addition, the currency exchange system 107 can calculate a risk exposure based upon sales volume and market data. In one embodiment, risk calculation is performed for a given currency, using an aggregate of transactions consummated in a particular currency. In another embodiment, risk calculation is performed for an aggregate sum of transactions relating to a particular client. Other risk calculations can also be performed and are within the scope of this invention, for example a currency exchange institution may wish to calculate its entire exposure relating to all clients and all currencies.

Computers 101-107 150 in an Online Risk Management system may be connected to each other by one or more network interconnection technologies. For example, dial-up lines, token-ring and/or Ethernet networks 110, 140, T1 lines, asynchronous transfer mode links, digital subscriber lines (DSL), wireless links and integrated service digital network (ISDN) connections may all be combined in the network 100. Other packet network and point-to-point interconnection technologies may also be used. Additionally, the functions associated with separate processing and database servers in a host 150 may be integrated into a single server system or may be partitioned among servers and database systems that are distributed over a wide geographic area.

Fig. 2 shows a flow of one exemplary method for providing risk management relating to an on-line e-commerce system. A currency price can be negotiated for a particular client and entered into a currency exchange system. The currency price is typically based upon projected or actual sales and market data for the particular client. However, any algorithm suitable to a particular situation can be used to determine the currency price 202. A currency price can be contractually adhered to for a predetermined time schedule.

Once a currency price has been entered 202, a commerce system can be made available to complete an on-line sales transaction 203. The present invention is particularly suitable to an on-line e-commerce system. However, other systems such as a proprietary network, or a computerized communications system utilized at a point-of-

sale in a brick and mortar type sales establishment, can also be used as a vehicle to capture a financial transaction 203. In this embodiment, a price for a commodity can be guaranteed for a period of time such that when a customer consummates a sale within that period of time, the customer will receive the guaranteed price. For example, a customer an agreement for a particular price for gasoline for a predetermined period. When the customer purchases gasoline, the gas pump becomes the point of sale. The gas pump, cash register, or other point of sale register, can act as a network access device to access information on the customer and the agreement for a predetermined period. The customer is then charged at the agreement price. Similarly, other commodities, such as those used as raw materials for manufacturing can be purchased at a predetermined price, thereby eliminating the risk associated with fluctuating markets. Point of sale can therefore include any place that a deal is consummated. In this manner, purchase order terms can be negotiated in a traditional format of two humans counterparts engaged in conversation. Typically such agreements are reduced to a paper contract containing terms which can be entered into the system. The system can subsequently be accessed at a point of sale or point of delivery.

Regardless of how a transaction is completed 203, transaction information is transferred to a currency exchange system 204. Typically, the transfer is accomplished via signal on a computer communications system. The transaction information can include the currency type and amount of a particular transaction. A currency exchange system can apply a market price or a predetermined currency price contracted for the time period including the transaction time 205.

In addition, the currency exchange system can be used to determine risk exposure for a designated time period using an aggregated transaction amount 206. The time period can be, for example, a calendar day, a week or month. The time period can also be more exacting such as a number of hours, or real time. Real time can include a time period with no artificial delays other than processing time. Risk exposure can be calculated using current market data and transaction volume for a particular currency. For example, risk exposure can include an aggregate of all sales transacted in a particular currency, or an aggregate of all transactions for all currencies involved, at the current market price.

Upon expiration of a predetermined time period, a currency price can be renegotiated 207 for subsequent transactions. Typically, renegotiation of a currency price will be based upon an actual sales history and market data.

Referring now to Fig. 3a, in one embodiment of the present invention, an e-seller site 312 can be accessed by one or more buyers 311. Typically the buyer will access the e-seller site via a computer communications network 100 with a network access device 101-106. The buyer 311 can transmit a bid for a good or service offered by the e-seller site 312, wherein the bid is denominated in a currency local to the buyer 311. Typically, the bid will be sent electronically, such as through an online bid form hosted by the e-seller site 312. However, more traditional quotes, such as a verbal quote, a facsimile or a hardcopy can also be received by the e-seller site 312 and entered into an underlying computer communications system. The e-seller site 312 can transmit the bid information to a Currency Exchange Institution 314. The Currency Exchange Institution 314 can calculate and transmit the amount of the bid denominated in a currency local to the seller 312. The calculation for the currency exchange can be according to a predetermined currency price or a market price.

It may be desirable that the calculation be accomplished transparent to the buyer 311 and the e-seller site 312, wherein the buyer and seller each views a bid denominated in a currency respectively local to each. However, each bid can also be viewed with the amount denominated in a currency local to the buyer and denominated in a currency local to the seller displayed side by side. Bids can also be ranked and viewed amongst other received bids.

Embodiments can also include a buyer that is an individual consumer or a corporate entity which accesses an Internet e-commerce site to purchase a good or service, wherein the good or service has been priced in the buyer's local currency.

Referring now to Fig. 3b, another embodiment of the present invention allows a seller 321 to access an e-buyer site 322. The embodiment is particularly useful to address the needs of a corporate buyer. The corporate buyer, or a private individual, can post their current needs on an e-commerce site acting as an e-buyer site. For example, current needs can be displayed as a request for bids on a required good or service. An e-seller 321 can submit a quote, or other offer to sell to the e-seller site 322. Typically, the quote will be sent electronically, such as through an online bid form hosted by the e-buyer site 322. However, more traditional quotes, such as a verbal quote, a facsimile or a hardcopy

can also be received by the e-buyer site 322 and entered into an underlying computer communications system.

The e-buyer site 322 can transmit the bid information to a Currency Exchange Institution 314. The Currency Exchange Institution 314 can calculate and transmit the amount of the bid denominated in a currency local to the buyer 312. The calculation for the currency exchange can be according to a predetermined currency price or a market price.

In one embodiment, it may be desirable that the calculation be accomplished transparent to the seller 321 and the e-buyer site 322, wherein the buyer and seller each views a bid, and its ranking amongst other received bids, only in a currency local to each entity. In another embodiment, each bid might be viewed with the amount denominated in a currency local to the buyer and denominated in a currency local to the seller displayed side by side.

Embodiments can also include a seller that is an individual consumer or a corporate entity which accesses an Internet e-commerce site to sell a good or service, wherein the good or service has been priced in the seller's local currency.

Referring now to Fig. 4a, a block diagram illustrates an embodiment of the invention. A seller 411 communicates with one or more buyers 414-417 via a communications network 413. The buyer 411 can facilitate the communication by hosting a transaction forum 412. Typical transaction forums include an Internet site, a proprietary network or a dial up network, although other types of forums are within the scope of the invention. Details of a transaction involving the seller 411 and a buyer 414-417 are communicated to a Currency Exchange Institution 314 via a delivery medium 418. The delivery medium can include, for example, a host computer 150, a network interface, a router or any other electronic medium capable of interfacing between the transaction forum and the Currency Exchange Institution. The delivery medium 418 can communicate via a link 419 with the communications network 413, or be directly connected to the transaction forum 412, such as, for example, through a direct feed 410.

Similarly, as depicted in Fig. 4b, a buyer 421 can initiate a transaction and communicate with one or more suppliers 424-427. The buyer 421 can communicate with one or more suppliers 424-427 via a communications network 413. The buyer 421 can facilitate the communication by hosting a transaction forum 422. Typical transaction forums include an Internet site, a proprietary network or a dial up network, although

other types of forums are within the scope of the invention. Details of a transaction involving the buyer 421 and a supplier 424-427 are communicated to a Currency Exchange Institution 314 via a delivery medium 418. The delivery medium 418 can communicate via a link 429 with the communications network 413, or be directly connected to the transaction forum 422, such as for example, through a direct feed 420.

A flow chart depicting the steps a buyer can implement is shown in Fig. 5. The buyer can enter into the system a Request for Bids 502 relating to a need of the buyer. The need can be for a particular part and a quantity desired, a service to be rendered, a security, a currency exchange, or almost any type of business transaction. The system can present the request to one or more vendors 503. In a preferred embodiment, the presentation 503 will be accomplished via a transaction forum 412 such as an Internet web site. However, other forms of presentation can also be utilized, such as, for example, publication in newspapers or other media, direct mail, e-mail, oral conveyance and other well known methods of business correspondence.

A bid from a local vendor can be entered into the system and received by the buyer 504. The system is capable of receiving a bid denominated in a currency local to the vendor 504 and presenting the bid to the buyer denominated in a currency local to the buyer 505. In one embodiment, the bid can be presented to the buyer and the local vendor in amounts denominated in both currencies 506. In addition, bids can be received from multiple vendors, each bid denominated in a currency local to the respective vendors 507. The system can display the bids in both currency in which the bid was received and the currency local to the buyer 508. The buyer can also designate a currency in which it would like to conduct its business even if it is not the currency local to the buyer 509. For example, an international corporation may wish to conduct its business in U.S. Dollars, even if a transaction is local to Germany. In this example, the "Currency local to the buyer" can be designated as U.S. Dollars and the system will present bids to the buyer in U.S. Dollars. Bids can also be ranked according to criteria specified by the buyer, including the most economical bid, or the chronological receipt of bids 510. A bid determined to be the most favorable by the system can also be color enhanced or otherwise designated.

In another aspect of the present invention, language included in a request for bid and/or language included in a bid can also be translated by the system 511. Software providing for language translation is well known and can be conveniently incorporated

can also be received by the e-buyer site 322 and entered into an underlying computer communications system.

The e-buyer site 322 can transmit the bid information to a Currency Exchange Institution 314. The Currency Exchange Institution 314 can calculate and transmit the amount of the bid denominated in a currency local to the buyer 312. The calculation for the currency exchange can be according to a predetermined currency price or a market price.

In one embodiment, it may be desirable that the calculation be accomplished transparent to the seller 321 and the e-buyer site 322, wherein the buyer and seller each views a bid, and its ranking amongst other received bids, only in a currency local to each entity. In another embodiment, each bid might be viewed with the amount denominated in a currency local to the buyer and denominated in a currency local to the seller displayed side by side.

Embodiments can also include a seller that is an individual consumer or a corporate entity which accesses an Internet e-commerce site to sell a good or service, wherein the good or service has been priced in the seller's local currency.

Referring now to Fig. 4a, a block diagram illustrates an embodiment of the invention. A seller 411 communicates with one or more buyers 414-417 via a communications network 413. The buyer 411 can facilitate the communication by hosting a transaction forum 412. Typical transaction forums include an Internet site, a proprietary network or a dial up network, although other types of forums are within the scope of the invention. Details of a transaction involving the seller 411 and a buyer 414-417 are communicated to a Currency Exchange Institution 314 via a delivery medium 418. The delivery medium can include, for example, a host computer 150, a network interface, a router or any other electronic medium capable of interfacing between the transaction forum and the Currency Exchange Institution. The delivery medium 418 can communicate via a link 419 with the communications network 413, or be directly connected to the transaction forum 412, such as, for example, through a direct feed 410.

Similarly, as depicted in Fig. 4b, a buyer 421 can initiate a transaction and communicate with one or more suppliers 424-427. The buyer 421 can communicate with one or more suppliers 424-427 via a communications network 413. The buyer 421 can facilitate the communication by hosting a transaction forum 422. Typical transaction forums include an Internet site, a proprietary network or a dial up network, although

can also be received by the e-buyer site 322 and entered into an underlying computer communications system.

The e-buyer site 322 can transmit the bid information to a Currency Exchange Institution 314. The Currency Exchange Institution 314 can calculate and transmit the amount of the bid denominated in a currency local to the buyer 312. The calculation for the currency exchange can be according to a predetermined currency price or a market price.

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other types of forums are within the scope of the invention. Details of a transaction involving the buyer 421 and a supplier 424-427 are communicated to a Currency Exchange Institution 314 via a delivery medium 418. The delivery medium 418 can communicate via a link 429 with the communications network 413, or be directly connected to the transaction forum 422, such as for example, through a direct feed 420.

A flow chart depicting the steps a buyer can implement is shown in Fig. 5. The buyer can enter into the system a Request for Bids 502 relating to a need of the buyer. The need can be for a particular part and a quantity desired, a service to be rendered, a security, a currency exchange, or almost any type of business transaction. The system can present the request to one or more vendors 503. In a preferred embodiment, the presentation 503 will be accomplished via a transaction forum 412 such as an Internet web site. However, other forms of presentation can also be utilized, such as, for example, publication in newspapers or other media, direct mail, e-mail, oral conveyance and other well known methods of business correspondence.

A bid from a local vendor can be entered into the system and received by the buyer 504. The system is capable of receiving a bid denominated in a currency local to the vendor 504 and presenting the bid to the buyer denominated in a currency local to the buyer 505. In one embodiment, the bid can be presented to the buyer and the local vendor in amounts denominated in both currencies 506. In addition, bids can be received from multiple vendors, each bid denominated in a currency local to the respective vendors 507. The system can display the bids in both currency in which the bid was received and the currency local to the buyer 508. The buyer can also designate a currency in which it would like to conduct its business even if it is not the currency local to the buyer 509. For example, an international corporation may wish to conduct its business in U.S. Dollars, even if a transaction is local to Germany. In this example, the "Currency local to the buyer" can be designated as U.S. Dollars and the system will present bids to the buyer in U.S. Dollars. Bids can also be ranked according to criteria specified by the buyer, including the most economical bid, or the chronological receipt of bids 510. A bid determined to be the most favorable by the system can also be color enhanced or otherwise designated.

In another aspect of the present invention, language included in a request for bid and/or language included in a bid can also be translated by the system 511. Software providing for language translation is well known and can be conveniently incorporated

into the system of the present invention. The translation can allow for global participation in business to business or other transactions with increased convenience to the participants. Each participant, such as the buyer and the seller can enter descriptive information into the system in a currency and language desired by a first participant and the system can present the information to a second participant with amounts denominated in a second currency and translated into a second language.

Referring now to Fig. 6, a user interface 610 utilized by the present invention can include a portion of a display screen containing a description 611. The description can include information relating to a bid, a request for bid, or any other information relating to a transaction. The description portion of a display interface can be translated by the system into a language desired by a viewer of the interface. The user interface 610 can also include bid information 612-614. The bid information can include an amount of a bid, or an amount a buyer is willing to pay for a need. The bid information 612-614 can be denominated in a currency desired by a viewer, or denominated in an amount desired by the originator of the information, if the originator is not the viewer. For example, the viewer may be the buyer and the amounts may be viewed in the currency of an originator such as a bidder. Bid information 612-614 can also be ranked. Ranking can occur according to predetermined criteria, criteria input by a viewer, or other criteria entered into the system.

An alternate user interface 710 that can be utilized by the present invention is depicted in Fig. 7. The alternate user interface 710 can include an originator column of bid information 711-713 and a bidder column of bid information 714-716. Each column can display information in a currency and language local to, or otherwise desired by the originator or bidder. The originator is typically a buyer or seller depending on the nature of the transaction. The bidder can be a counterparty responding to an offer put forth by the originator. A descriptive portion 717 can also be included in the alternate user interface 710.

Upon consummation of a transaction, such as a sale, a e-seller site 312, an e-buyer site 322, a transaction forum 412 or other e-commerce participant hosting an e-commerce site, can transmit notification of the transaction to a currency exchange server related to a currency exchange institution, thereby updating the server on the notional in local currency. The notification can be real-time or periodic. The e-commerce participant exchanges a local currency quantity equal to an aggregate of all sales for the specified

time period with the currency exchange institution at a predetermined fixed exchange rate. A total exchange may be accomplished via multiple exchanges, for example daily exchanges, throughout the predetermined time period. The predetermined fixed exchange rate can be negotiated with the currency exchange institution at the beginning of the specified time period and remain good for the duration of the time period.

The currency exchange institution can also send the e-commerce participant one payment in their pre-specified base currency, following normal spot settlement conventions,  $t+2$  in most instances, or settled on an agreed upon date, such as a forward date of  $t+5$  wherein  $t$  represents the time of the transaction. The base currency will typically be the currency local to the e-commerce participant, although it can also be another currency if desired.

Another embodiment can include a similar technology but with a price for a given transaction that reflects market price for the time of an e-commerce transaction. Still another embodiment can include prices specified according to a predetermined pricing algorithm, such as one that includes market data.

In one aspect of the invention, an interface to an online auction site, such as those well known on the world wide web (WWW) or any other known auction protocol, can enable global auctions where bidders bid in local currencies and the auction site accurately determines a winner in a seller's currency. This enables both bidders and sellers to better realize the implications of the transaction. Enablement of this aspect can include an automatic posting online wherein the bid price is denominated in the currency local to the bidder as well as a posting denominated in the currency local to the seller. The postings can be accomplished in real time allowing all participants to understand the value of each bid. The exchange rate can also be included in the determination of a winning bid. Each participant in the auction can retrieve the bidding information relating to the auction and display the bid in a currency local to each participant and a currency local to the seller. In one embodiment, the seller's currency can be referred to as the "base" currency and the bidders currency referred to as the "foreign" currency.

In another aspect of the invention, a hedging strategy can relate to a standard contract wherein a market rate is fixed for a "reset period," and is not changed until the next reset period. This scenario can assume no constraints on notional amount. In another variation, an upper and/or lower limit is fixed on the notional amount.

One embodiment includes a currency exchange institution entering into a single forward contract until the end of the reset period to buy base currency, or the currency native to the seller, and sell foreign currency, wherein  $m = \#$  of exchange periods in a reset period. One forward contract settles at the end of each exchange period and is put on with a quantity of foreign currency equal to the expected average amount for that exchange period.

Another alternate embodiment allows the currency exchange institution to enter into a single forward contract at the beginning of each reset period. At the end of the reset period the currency exchange institution can buy base currency and sell foreign currency. The foreign currency notional of the forward contract is calculated as:

Formula:

$$N_{\text{tot}} = \sum_{i=1}^m N_o(i) / D_f(i)$$

where  $N_o(i)$  = expected currency notional for exchange period  $i$ .

$D_f(i)$  = "forward" discount factor in the foreign currency from the end of exchange period  $i$  to the end of the reset period.

$m$  = # of exchange periods per reset period.

Other embodiments allow the currency exchange institution to buy straddles around the average forward, one expiring each day of the reset period, with notional on the  $i^{\text{th}}$  straddle equal to the formula:

$$\propto (i) N_o(i)$$

wherein  $N_o(i)$ , where  $N_o(i)$  = expected average foreign currency notional for  $i^{\text{th}}$  or  $o^{\text{th}}$  period, and  $\alpha(i)$  = standard deviation of the  $i^{\text{th}}$  notional as a fraction of  $N_o(i)$ . This straddle buying strategy can also be applied to the second alternate embodiment.

In addition, the currency exchange institution can buy a single straddle that expires at the end of the reset period, with notional of:

$$N_{tot} = \sum_{i=0}^n \alpha(i) N_0(i) / D_F(i)$$

In another aspect of the invention, limiting the notional may attach limits to the transactional size that can be transacted over a given period. In addition, limiting the size of spot movements – i.e., if spot moves more than x% over the fixed time period (one week, one month, etc.) the currency trading institution can reserve the right to change the exchange rate. A sales agent may be contractually required to process all transactions to the currency trading institution, wherein they do not try to arbitrage the rate by doing more or fewer transactions based upon where the exchange rate is and it not being a reflection of the underlying sales from business. In one embodiment, a computerized system automatically monitors each transaction by receiving a data feed as each transaction is completed.

Typically, in each period  $\Delta t$ , a sales agent will exchange an unknown notional amount. The present invention will convert it at an agreed spot rate  $S_a$ . This spot rate is reset every  $m$  “exchange periods”. (For example this period  $T_p = m\Delta t$  can be called the reset period.)

This can continue for  $n$  reset periods; the total contract period  $T_c \equiv T_p \equiv mn \Delta t$ . An example edge that can be required in reset spot could be set forth as:

$$\epsilon = \kappa \alpha \sigma \sqrt{\frac{\Delta t (m+1)}{2nm(1 - \frac{\kappa^2 \alpha^2}{nm})}}$$

where  $\epsilon$  = spot edge and is defined by  $S_a = \text{spot for a reset period} = S_0 (1 - \epsilon)$   
 where  $S_0$  = average forward (averaged over the  $m$  exchange dates)

$\alpha$  = estimated standard deviation of currency notional amounts (each  $\Delta t$ ) as a fraction of the average currency notional

$\sigma$  = estimated volatility of the spot exchange rate

$\Delta t$  = length (in time) of each exchange period

$m$  = # of exchange periods in a reset period

$n$  = # of reset periods in the contract period

$k=N^{-1}(P)$  where  $P$  = probability the currency exchange institution will make money in the contract period; here,  $N^{-1}(x)$  = inverse cumulative standard normal distribution.

Notional information requires intimate knowledge of a sales agent's past sales figures to predict mean and standard deviation of future sales. Actual sales data is most accurate; however, a sales agent's revenue predictions can also be used.

In still another aspect, a credit card company may pay receipts directly into a currency exchange institution bank account on a retailer's or other online sales agent's behalf. The currency can then be converted into a currency of the client's choice. Preferably, the converted currency is agreed upon in advance, although an exchange institution can also provide a selection of available currencies with an exchange rate for each currency. In addition, by arrangement, a portion of receipts may not be converted into currency of client's choice, but instead may be retained in an amount to cover taxes and expenses in a local currency.

In one embodiment, this present invention can be utilized in conjunction with a brick and mortar type retailer or financial institution. Brick and mortar establishments can be embodied by the well-known physical storefront scenario into which a customer enters to make a transaction. The transaction may include a retail purchase, a banking transaction, a catalog purchase, a standing order or any other type of transaction, which entails a transfer of currency. Other brick and mortar establishments can include a credit card company, a regional bank, or other suitable enterprise.

To facilitate operational and accounting aspects of the present invention, a client may be required to transfer currency receivables, usually payable by a third-party credit card company, to the Currency Exchange Institution. These monies may be paid to the existing Currency Exchange Institution bank accounts wherein they can be credited to the client's account on Currency Exchange Institution books. An additional special purpose bank account to facilitate this process can also be opened. On a regular basis, a Currency Exchange Institution can receive notification from a client or from a third party such as a credit card company relating to an amount of currency receivables to be transferred. Notification and transfer may be on a daily basis, but also may be periodic, such as weekly or monthly. If desired, it can be presumed that each payment date will be a valid banking business day in the local country of the currency being transferred.

Alternatively, a global type transaction may make transfer available 24 hours a day each day of the year more desirable. Notification would preferably be electronic, but may be verbal, written or otherwise. If electronic, notification may be communicated to the Currency Exchange Institution via a direct communication over a private network, virtual private network, distributed network, API, flat file, or any other electronic means arranged between the Currency Exchange Institution and the client.

Upon notification, a Currency Exchange Institution's local agent bank can be notified of anticipated receipts. The receipts can be credited to the client's account with the Currency Exchange Institution. If accounting, or other reason, determines that it would be favorable to credit these monies to an internal Currency Exchange Institution account, this type of credit can also be facilitated.

A balance can be tracked, on a daily basis or otherwise, by the Currency Exchange Institution's accounting sub-ledger or an e-commerce participant's computer 101-106. The e-commerce participant's computer 101-106 can have the ability to track balances, provide periodic statements, accrue and report interest, and alert individuals of negative balances. At the time of the periodic rate fixing/reset and the settlement of a previous period's cash flow, a holding account can be debited the sum total of the previous period's receipts and credited with the counter-currency payable to the client. This money can be held on account with a Currency Exchange Institution, or can be payable, on demand or on a pre-arranged basis, to the client. In addition, interest may be paid to or received from the client on balances held at the Currency Exchange Institution.

Other variations can include an e-commerce participant choosing to send one payment to a Currency Exchange Institution out of an e-commerce participant's own local bank account, or out of a third-party account. Alternatively, payments on e-sales transactions may be made directly into a Currency Exchange Institution bank account in a local country of operation.

Exchanges of currency may occur more frequently than the time period for which a fixed exchange rate has been set. They may occur as every transaction takes place, daily, weekly, monthly, etc. (e.g., "real time") as long as it is within the time period to which the fixed exchange rate applied. Alternatively, exchanges may occur, but are not limited to, when a certain local currency notional amount is reached or a certain number of transactions take place.

In some instances, a Currency Exchange Institution can bear a day credit exposure to the e-commerce participant. However, in other instances, a Currency Exchange Institution may bear credit exposure to the underlying consumer or, in a business to business environment, to a corporate purchaser of goods and/or services on an e-retail site. In the future, this counterparty credit risk may be securitized and sold to a third party.

Technology used to implement aggregation on the client side can include software which can be based on a Currency Exchange Institution's UNIX/Windows NT risk management system. One embodiment can allow the aggregation system to be entirely controlled by the client. Appropriate safeguards can be put in place to discourage a client from arbitraging exchange rates. Alternatively, the client and a Currency Institution may jointly monitor the aggregation of transactions in a database, or as notional data is determined, it can be fed directly to a Currency Exchange Institution implementing this invention.

Transmission of aggregation data from the client to a currency exchange provider or other institution that provides the service of exchanging currency can be accomplished with a distributed network such as the Internet manually, over the telephone or email via proprietary API or in a standardized format (standard text formatted in a pre-agreed way). Additionally it may be passed directly into an electronic trading system via an electronic format.

Trading can be based on aggregate currency notional data. A decision to trade may be entirely manual (aggregate data passed to a trader manually or electronically), or may happen automatically, with aggregate notional data passed into an electronic trading system.

Determination of contract exchange rates can be accomplished manually or automatically off a pre-specified fix.

Expected notional, and thus pricing, can be based upon predictions of an e-commerce participant's future revenue. In another aspect, to engage in this function within applicable banking laws the entire product may be securitized. Notional predictions can also be predicated upon seasonal, calendar or other cyclical criteria.

In other embodiments, a netting arrangement can be implemented wherein a customer can receive a rebate based upon the sum totals of each currency exchanged at



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Technology used to implement aggregation on the client side can include software which can be based on a Currency Exchange Institution's UNIX/Windows NT risk management system. One embodiment can allow the aggregation system to be entirely controlled by the client. Appropriate safeguards can be put in place to discourage a client from arbitraging exchange rates. Alternatively, the client and a Currency Institution may jointly monitor the aggregation of transactions in a database, or as notional data is determined, it can be fed directly to a Currency Exchange Institution implementing this invention.

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In other embodiments, a netting arrangement can be implemented wherein a customer can receive a rebate based upon the sum totals of each currency exchanged at

the end of a predetermined time period. The rebate can be given for one currency netting against another currency. For example, if a customer has a retail scenario which calls for 100 £ Sterling to be converted to U.S. Dollars at the end of a month, and the same customer's retail scenario also calls for 90 Eurodollars to Sterling, the netting arrangement may only call for 10 £ Sterling to be converted to U.S. Dollars. In one embodiment, a netting arrangement can allow for the rebate to be saved to the last transaction of the month such that the exchange rate can be modified for that transaction to reflect the rebate.

Retail exchange rates can also be associated with particular products. A customer may negotiate different contract expiration dates for an exchange rate for different products. For example, a particular customer may be involved in selling automobiles as well as automobile parts. In order to properly accommodate the difference in price between the automobile and the automobile parts, and the conceivable resultant exposure, separate expiration dates for a guaranteed exchange rate can be implemented for each product.

A spot transaction rate or a market transaction rate can also be implemented for each transaction wherein a floating transaction rate for a given point in time is applied to each transaction occurring at that point in time.

The invention may be manifested in digital electronic circuitry, or in computer hardware, firmware, software, or in combinations of them. Apparatus of the invention may also be implemented in a computer program product tangibly embodied in a machine-readable storage device for execution by a programmable processor; and method steps of the invention may be performed by a programmable processor executing a program of instructions to perform functions of the invention by operating on input data and generating output.

One or more computer programs can be executable on a programmable system including at least one programmable processor coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Each computer program may be implemented in a high-level procedural or object-oriented programming language, or in assembly or machine language if desired; and in any case, the language may be a compiled or interpreted language. Suitable processors include, by way of example, both general and special purpose microprocessors.

A number of embodiments of the present invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, computers 101-106 can comprise a personal computer executing an operating system such as Microsoft Windows™, Unix™, or Apple MacOS™, as well as software applications, such as a web browser. Customer computers 101-106 can also be terminal devices, a palm-type computer web access device that adhere to a point-to-point or network communication protocol such as the Internet protocol. Other examples can include TV web browsers, terminals, and wireless access devices (such as a 3-Com Palm VII organizer). A customer computer may include a processor, RAM and/or ROM memory, a display capability, an input device and hard disk or other relatively permanent storage. Accordingly, other embodiments are within the scope of the following claims. Similarly, the host system 150 and the currency exchange system can be any computer system known to those skilled in the art.



## CLAIMS

What is claimed is:

- 1) A computer-implemented method for providing risk management for online transactions, the method comprising:  
entering an exchange price for a foreign currency into a computer as the foreign currency relates to a base currency;  
receiving data descriptive of a transaction involving the foreign currency, wherein the transaction occurred within a predetermined time period; and  
exchanging currency according to the entered price and received data descriptive of the transaction.
- 2) The method of claim 1 additionally comprising the step of determining a risk exposure for the predetermined time period, wherein the risk exposure is based upon an aggregate amount of currency involved in transactions during the predetermined time period.
- 3) The method of claim 2 wherein the risk exposure is additionally based upon market data.
- 4) The method of claim 1 additionally comprising capturing each transaction amount that relates to a sale occurring on an e-commerce site and automatically exchanging currency at the price entered for the local currency.
- 5) The method of claim 1 wherein the transaction is a retail transaction between a business and a retail customer.
- 6) The method of claim 1 additionally comprising receiving bids in an online auction and posting online each bid in a local currency and a seller's currency.
- 7) The method of claim 1 wherein the transaction is a business to business transaction.
- 8) The method of claim 1 wherein the transaction is an online sales transaction consummated over a computerized communications network.
- 9) The method of claim 1 additionally comprising obtaining a spot price from the market at the time of the transaction.

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- (72) Inventor: COPPOLA, James, P., III; Suite 3, 1200 Wash- ington Street, San Francisco, CA 94108 (US).
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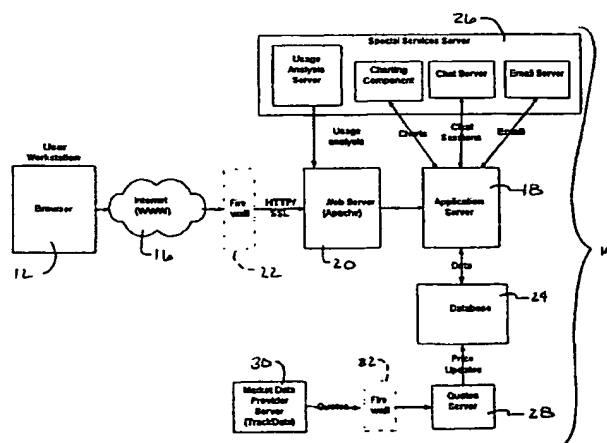


FIG. 1: SYSTEM ARCHITECTURE

(57) Abstract: A method and system for managing investment portfolio risk on a computer system. A plurality of parameters, including an identifier, a market price, a stop-loss price, a commission, a skid, and a number of shares or contracts all associated with an investment instrument, are stored on a computer-readable medium, along with an equity value associated with a user's portfolio. A point risk value is determined for a potential investment. The point risk value is an intermediate value multiplied by the number of shares or contracts, the intermediate value comprising the market price minus the stop-loss price plus the commission plus the skid (for long transactions). A plurality of risk scenarios are displayed showing proposed numbers of shares or contracts associated with the point risk value for a plurality of selected size risk values. Other risk characteristics may also be determined and displayed. The system and method may be embodied in a variety of implementations, such as in a client/server system or in a stand-alone computer system.

## TITLE OF THE INVENTION

Portfolio Accounting And Risk Management System

5

## CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application No. 60/137,690, filed on June 4, 1999, the disclosure of which is incorporated by reference herein.

10

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR  
DEVELOPMENT

N/A

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## BACKGROUND OF THE INVENTION

In securities trading, most coverage and advice for the common investor focuses on returns and profits. A fundamental strategy espoused by industry leaders revolves around selecting the best stocks that will provide returns over the long term. Managing risk is important, and a core tactic carried out within the industry. But, for the common investor, according to conventional wisdom, risk management is best handled by diversification and asset allocation. This is based on the maxim that business is cyclical and maintaining a portfolio of diverse investments in quality stocks minimizes risk. In any given cycle, there are high-fliers and as well as laggards. Diversity allows the investor to benefit from this and participate in the financial markets. Despite this, peak performance remains tied to

20

25

30

one's ability to pick better securities and increase concentration of the portfolio's exposure to the winners while eliminating losers.

5 SUMMARY OF THE INVENTION

It remains, however, that no one can predict the future, and securities selection, deciding what and when to buy and sell, is only part of the investment process.

10 The present invention provides a better approach towards trading and investing for the self-directed investor by taking a more objective approach to managing risk. Rather than attempting to predict the future or gambling on a specific security, financial rewards are obtained by managing the amount of assets placed at risk  
15 in any given investment and for a portfolio as a whole. Using this approach, the investor will lose no more than is planned, while at the same time enjoy whatever gains may materialize.

20 The system also provides users not only with the ability to view risk at the level of an individual trade, but to also do the same within the context of bigger and more flexible portfolios, thereby providing users with a more real world-like situation for risk management.

25 Once a user has determined what security in which to invest, the user needs tools to help answer how much to buy or sell. This question can be reformulated as how much risk to which the user should be exposed. The present system provides a sizing module to address this question. This module addresses a number of parameters,  
30 such as type of security, current equity, current security price, and downside limit concentration.

## DESCRIPTION OF THE DRAWINGS

The invention will be more fully understood from the following detailed description taken in conjunction with  
5 the accompanying drawings in which:

Fig. 1 is a block diagram showing a client computer system and a server computer system communicating over the World Wide Web ("Web") in accordance with an illustrative embodiment of the present invention;

10 Fig. 2 is a block diagram showing a physical deployment as a web farm;

Fig. 3 is a block diagram showing logic modules;

Fig. 4 is a diagrammatic representation showing services provided by the present system from a user's  
15 level;

Fig. 5 is a block diagram showing a logical deployment of the present system;

Fig. 6 is an exemplary main display screen of the present system;

20 Fig. 7 is a flow chart of initial steps in the present system;

Fig. 8 is a flow chart of a sizing module of the present system;

Fig. 9 is an exemplary display screen provided by  
25 the sizing module;

Fig. 10 is a flow chart of a trading module of the present system;

Fig. 11 is an exemplary display screen provided by the trading module;

30 Fig. 12 is a flow chart of a tracking module of the present system;

Fig. 13 is an exemplary display screen provided by the tracking module;

Fig. 14 is a flow chart of a protection module of the present system;

5        Fig. 15 is an exemplary display screen provided by the protection module;

Fig. 16 is an exemplary display screen of a risk report;

10       Fig. 17 is an exemplary display screen of a performance report;

Fig. 17A is a flow chart of a performance reporting function of the present system;

Fig. 18 is an exemplary display screen of an option price calculator;

15       Fig. 19 is a flow chart of a trading register function of the present system;

Fig. 20 is an exemplary display screen of a trade register;

20       Fig. 21 is a diagrammatic representation showing administration and maintenance services provided by a system administrator;

Fig. 22 is an exemplary code block for performing risk calculations;

25       Fig. 23 is a further exemplary code block for performing risk calculations;

Fig. 24 is a further exemplary code block for performing risk calculations;

Fig. 25 is an exemplary display screen of a portfolio selection function of the present system;

30       Fig. 26 is an exemplary display screen of a portfolio building function of the present system;

Fig. 27 is an exemplary display screen of data editing functionality of the present system;

Fig. 28 is an exemplary display screen of expired stops; and

5        Fig. 29 is an exemplary display screen of maintenance options of the present system.

#### DETAILED DESCRIPTION OF THE INVENTION

Consistent with an illustrative embodiment of the present invention, Fig. 1 shows a client system 12 and an application server system 14 communicating over the World Wide Web 16 ("Web" or "WWW"). For purposes of illustration, the Web may be defined as those resources and users on the Internet using the Hypertext Transfer protocol (HTTP) to communicate information. Further for purposes of illustration, the client system and the application server system may, for example, consist of personal computers, work stations, Internet appliances, or any other type of hardware platform capable of executing computer software. Accordingly, each of the client system and application server system may include one or more processors, which are communicably coupled to a computer program storage device such as a computer memory, as well as one or more input/output devices. Further for purposes of illustration, the client system includes an Internet browser application program, operable to request data from the application server system responsive to actions preformed by a user of the client system.

30        The application server system 14 includes an application server 18 that functions as a node on which

all business services run. Business services are objects that service the graphical user interface of the present system, described further below. A web server 20 is provided for managing web-based client access to the system. Because data transmitted between the client system and the application server system is often sensitive or confidential, a firewall 22 outside the web server using an authentication and encryption mechanism, such as Secure Socket Layer (SSL), is provided. A database 24 in communication with the application server is provided for storing data, discussed further below. External facilities, such as chat, charting, e-mail, obtaining price quotes, and usage analysis services may be provided on a special services server 26. A quotes server 28, also referred to herein as a market data server or data feed server, is provided in communication with the database for obtaining price quotes from an external market data provider 30. A firewall 32 is provided outside the quotes server for security.

Fig. 2 illustrates a preferred embodiment of the hardware deployment of the invention in a web farm implementation. It will be appreciated that more than one of each server (two are shown) may be provided to handle, for example, high volume activity. A director 34 is providing for load balancing of the web servers. Each web server machine 20a, 20b is connected to an application server machine 18a, 18b. The application server machines are each connected to a separate special services server machine 26 that hosts the specialized services. The application server machines are also each connected to a database server machine 25. Connection to external



service providers, such as an external market data server 30, is provided in a suitably secure manner, such as through a special T1 link or frame relay, possibly using an extranet or virtual private network and data feed server 28.

Any web server can be used for hosting a user-interface site for the system. The Apache web server is a robust server that performs well and is generally suitable. Other alternatives include Windows NT as the operating system and/or Microsoft IIS as the web server. The application server should provide pre-built frameworks and components that can be reused. In-built support for standards based Enterprise Java Beans and performance of processing the business logic is preferred. Also, dynamic replication and proper sharing of the load from simultaneous users hitting the site are desirable. Application servers from BEASYS, such as Weblogic, and UNIFY, such as e-Wave, are typically used in e-commerce and e-business spaces and are suitable. Any suitable web server and application hardware can be used. Preferably, a dual processor Pentium III with at least 512 MB of RAM and preferably 1 GB of RAM is used. The database used by the system is not critical. DB2 from IBM and Oracle 8I from Oracle are suitable. Others include Informix and SQL server. The database server may reside separately from the web server and the application server.

The system can be implemented in any programming language, and any operating system can be used as the platform for development of the user-interface site. Typically, financial institutions employ Java or CGI on

Unix-variant platforms, such as Linux, Sun Solaris, or IBM AIX. Java is particularly suitable as it performs substantially independently of the operating system.

Referring more specifically to Fig. 3, the application program provides a number of logic modules or packages that, in the preferred web-based implementation, reside on the application server and are accessible by the user residing at the client computer system. It will be appreciated that the various modules are capable of interacting with each other, although for clarity this interaction is not indicated on Fig. 3. The content of the logic modules is discussed further below. From the user's perspective, the user is provided with a variety of services (Fig. 4) that correspond generally to the logic modules.

Fig. 5 illustrates a preferred embodiment of a logical deployment of the system architecture using the J2EE architectural standard. The client 12 accesses the system through the web server 20. The web server redirects the client's requests to appropriate servlets/Java Server Pages 36a, 36b, 36c, . . . 36n, in the application server 18. The servlets/JSPs process the request and fetch required data if needed from the data base server 25 with the help of Enterprise Java bean objects 38a, 38b, 38c, . . . , 38n. The results of the request retrace the request path. It will be appreciated that other architectures may be provided.

Referring again to Fig. 3, a new user initially registers, using a register module 40. Within this module, the system collects a user ID, password (with "confirm password" input), and email address from the

user. The user chooses a user ID, and the system checks for uniqueness of the user ID and presents alternatives in case of ambiguities. The email address is used for communications, such as password reminders, alerts, 5 alarms, and messages, responses to queries, and regular service updates. A login module 42 is used for subsequent logins so that the user may gain access to the complete system. The login module provides the user with the option to save the user ID and password for auto login 10 purposes. The option of allowing a non-registered user limited access to browse as a guest may also be provided.

In a personalization module 44, the user may optionally specify preferences for ease of use. These preferences may include the currency in which the user 15 sees his overall positions, the country of major holdings, the user's sophistication level, typically either average or high, a help language, and a preferred risk-bearing capacity. The system provides defaults, such as to the US dollar for the currency, the United States 20 as the country of major holdings, and English as the help language. In the presently preferred embodiment, the preferred risk-bearing capacity may range from 0.25% to 5.00%, with a default value of 2.5%. It will be appreciated that other ranges and defaults may be 25 provided. The user also may request to receive price quotes through a quotes module 46 and may request to receive various forms of reports through a reports module 48.

An account manager module 50 is provided for 30 managing the portfolios and accounts of the clients. As used herein, an account is defined as a collection of

securities and a portfolio is defined as a combination of two or more accounts. Portfolios do not directly hold cash or other securities. After a user logs in, the account manager module provides a main screen (Fig. 6) with various options for the user. The presently preferred options are listed as "Size-It," "Trade-It," "Track-It," "Protect-It," "Risk Report," "Performance Report," "Trade Register," "Calculators," and "Maintenance." These options are discussed further below.

Within the account manager module, a user is able to add new accounts and delete existing accounts. The user may maintain multiple accounts and/or multiple portfolios. The user may add funds to an account and transfer funds between accounts. The user may transfer instruments between accounts of similar type. The user may select one account or one portfolio as the default for all subsequent operations. The default account and portfolio may be changed at any time. The user may update all accounts and receive alerts on all securities for all accounts at all times. All the currencies for the account or portfolio are displayed in the currency of the account or portfolio, except for stock currencies, which are displayed in the currency of the stock.

To set up an account, the user provides a text string for identification purposes and a text string that better describes what the account is about. The user then selects the type of account, such as stocks/mutual funds, stock options, futures, futures options, or another type, such as bonds. The system selects the base currency as the default currency previously selected. The system requests the name of the broker being used for the

account. The user next inputs current funds available (debit if on margin) in the account. The system requests validation of whether the account is a sample account or a user-defined account. The system also requests whether  
5 this account should be the default account for subsequent operations. The user may select up to three indexes, such as the Standard & Poor's 500 Index, against which account performance can be compared. Finally, the user inputs the margin the user has on the account. For example, a value  
10 of 50 indicates a 50% margin account. A value of 0 indicates a cash account.

To set up a portfolio, the user inputs a text string for identification purposes and a text string that better describes what the portfolio is about. The system selects  
15 the base currency as the default currency previously selected. The system also requests whether this account should be the default account for subsequent operations. The user may select up to three indexes, such as the Standard & Poor's 500 Index or the Russell 2000 Index,  
20 against which account performance can be compared. Referring to Fig. 7, the system is also able to update prices in the portfolio. Figs. 25 and 26 illustrate exemplary display screens for setting up and maintaining accounts and portfolios.

25 Once a user has determined what security in which to invest, the user chooses a sizing module 52, denominated "Size-It" herein for identification purposes. The sizing module provides the user with the tools to help answer how much of a particular security to buy or sell. This  
30 question can be reformulated as how much risk to which the user should be exposed.

Order sizing can be performed for equities, futures, or other types of instruments. User defined symbols (private symbols, for example, for instruments such as bonds) may also be sized with appropriate user inputs. It is not necessary for the user to select an account or portfolio for an order to be sized. However, more relevant results are obtained when the order is sized in relation to an existing account or portfolio. If the user selects an account, all calculations happen after converting the instrument's currency to the user's account currency. If the user has not selected an account, all calculations happen after converting the instrument's currency to the user's base currency.

The system may present average and sophisticated investors with differing complexities of user interface. A simpler user interface has fewer mandatory input fields and displays results in a simpler format. The system also provides the user with the ability to shift between the two interfaces.

Referring to Fig. 8, upon initialization, step 54, of the sizing module, the system updates prices and the user's equity. The system requires a user's equity at hand for calculating the buying power and for sizing different risk scenarios. For stock sizing, the equity is in the currency of the stock, and therefore this becomes currency (Fx) independent. For futures, the instrument's sizing is dependent on the currency per tick, and therefore is currency dependent. For registered users, the equity is picked up from the account or portfolio on which sizing is being performed. The system displays

certain portfolio risk characteristics, step 56, discussed further below.

The user enters certain data and information, step 58, before the system can calculate a risk scenario.

5 Preferably, the user enters the required data and information into input fields in a window such as that shown in Fig. 9. The user enters the type of security, stock/mutual fund (MF), future, option, or another desired type. Also, the user selects one of long or short

10 for stock or mutual fund shares or option contracts and buy (long) or sell (short) for futures contracts. Access to a symbol look-up table is provided in which the user may find a particular stock, mutual fund, stock option, futures, or futures option. The user may also input the

15 symbol directly. Once a symbol is selected, the system automatically fills in the name corresponding to that symbol. The current market price of the security is automatically retrieved. The currency is in the currency of the country where the symbol is listed. In case of

20 other types of instruments, the user enters the price manually only if the price for that symbol has not been entered in a private list.

The user enters a selected stop-loss price. The stop-loss price, also referred to as the stop price or

25 stop, is the price at which a user sells a losing position. A stop-loss price or point may be figured in several ways, such as volatility, chart points, percent retracement in price, and moving averages. For example, if the user is comfortable seeing a stock go down by only

30 20% from its current price, the user enters the price at this level. This sets the user's stop and provides for a

measurement of risk, discussed further below. If no stop price is entered, the default stop price is 25% of the current market price. Another default stop price could, of course, be set. The currency of the price is in the currency of the country where the symbol is listed.

The user also enters the skid or slippage amount that is anticipated in the transaction once the order is executed. If no skid is entered, the default skid is 5% of the current market price. Another default skid could, of course, be set. The currency of the price is in the currency of the country where the symbol is listed. The more liquid and the smaller the order is, relative to the securities trading volume, the less is the skid that can be expected. Also, the less obvious the stop price chosen, relative to the securities chart pattern and/or the less volatile the market, the less the skid that can be expected. Skid may also be affected, for example, by news reports, earnings and crop reports, obvious support and resistance chart points, and catastrophic events.

The user enters the commission per share or contract to be paid to the broker/dealer or futures commodity merchant for the transaction. This amount should be inclusive of all exchange handling fees and government taxes and fees. For example, if the commission is \$50.00 for 1,000 shares of stock, the user enters 0.05 cents a share. For futures and options, the broker/dealer or futures commodity merchant can provide an inclusive per-contract amount.

When trading options, the user selects the codes for put or call and for the expiry month, or the user directly enters the symbol with the codes manually. The



symbol remains the same until expiration or exercise of the option. For a futures contract, the user selects the month code or directly enters the symbol with the codes manually.

5           Futures gearing is shown to the user if the futures symbol is listed within the system. It is defaulted to the product of Fx/tic and tics per point for that future. The currency shown is in the currency of the future. If the future is not listed within the system, the user is  
10           prompted to enter the Fx/tic, the tics/point, the spec margin, and the customer margin (defaulted to the spec margin value unless the user inputs a different one) for that future.

          The user also enters the estimated buying power. The  
15           user should consult with the broker/dealer and futures commodity merchant to accurately determine the buying power for the stock account and the withdrawable funds and margin requirement for the futures account. The user also enters the amount of cash available for the purchase  
20           of securities.

          As discussed above in accordance with step 56, the system provides the user with an overview risk of the entire portfolio. The system uses the following macro-risk assumption formula, which is determined for each  
25           instrument:

          planned risk =  $(MP - SL + C + SKID) \times NS$ ,

          where

          MP = market price,

          SL = stop-loss price,

30           C = commission in and out,

          SKID = skid, and

NS = number of shares or contracts.

The system determines the user's total equity minus the sum of the planned risks for each instrument in the entire portfolio. This value is displayed for the user, for example, in the "Equity-Planned Risk" field in Fig. 9. The system also determines the user's risk/equity percentage, which is the sum of the planned risks for each instrument in the entire portfolio divided by the equity of the portfolio. This value is displayed as a percentage to the user, for example, in the "R/E" field in Fig. 9. The system also determines the user's risk to an existing position in the security under consideration, which is the sum of the existing risk related to the security in the portfolio divided by the equity of the entire portfolio. If the user does not presently own the security under consideration, this value is 0. This value is displayed to the user, for example, in the "Risk to Position" field in Fig. 9. The system also displays for the user the current buying power and available cash.

After the user enters the required data for the security under consideration, the system determines several risk characteristics and several risk scenarios, step 60, which are displayed for the user in a screen, Fig. 9. The system determines the point risk, which is the planned risk per share. The point risk is the difference between the price and the stop in the currency of the stock plus the skid plus commissions (long or buy):

$$\text{point risk} = \text{MP} - \text{SL} + \text{C} + \text{SKID}.$$

For short sales, the formula is the converse:

$$\text{point risk} = \text{MP} + \text{SL} - \text{C} - \text{SKID}.$$

Referring to Fig. 9, various risk scenarios are displayed in a montage within the window. The scenarios are calculated for various increments of risk within the specified range of risk bearing capacity selected by the user. As noted above, the default range is 0.25% to 5.00%. The scenarios are determined for risk increments of, for example, 0.25%, which are displayed under the column headed "Size %Risk." The risk increments may be variable. The size %risk range and incremental value(s) may be selected by the user. For each size %risk, a number of shares corresponding to that size %risk is calculated by multiplying the size %risk by the value of equity minus planned risk divided by the point risk. These values are displayed under the column headed "Shares." For example, for a size risk of 5.00%, a point risk of 19.681 and a value of equity minus planned risk of \$61,970.05, the number of shares to purchase is 157.

The new risk/equity is the sum of the risk of the entire portfolio plus the amount of additional risk, the size %risk (for example, 5.00%) that would be added by the transaction, for example, by purchasing the security under consideration. The size %risk is the percent of the total portfolio that would be at risk after the transaction for the given point risk. For example, for a portfolio with an existing risk/equity of 1.43%, a purchase having a size risk of 5.00% increases the risk/equity to 6.43%.

In the montage, the system displays for the user the number of shares (or contracts) corresponding to a given size risk. The system also displays the market value of the transaction, which is the number of shares multiplied

by the security price. For futures and options, the system includes an additional gearing mechanism (not shown). The system also determines the buying power that the user will have after the transaction occurs, which is the cost of the transaction subtracted from the existing buying power.

Figs. 22-24 illustrate an example of code suitable for performing the above risk calculations. Fig. 22 shows a code block that contains the core risk calculations used in the present system. This functionality may be called differently by different parts of the system depending on the context (totaling everything, totaling just stocks, futures, options, or just looking at a single position). Fig. 23 shows a code block that churns through the database evaluating all entries of the conditional type. Fig. 24 shows a code block that computes total market value and total risk of all the conditional elements, building on what was tallied in the code block of Fig. 23.

Given the various risk scenarios displayed by the sizing module, the user may decide whether to buy or sell the security and, if so, how much of that security to buy or sell. If the user decides to buy or sell the security, the user selects the trading module 70, denominated "Trade-It" herein. See Fig. 10. The user can access the trading module from the main screen or from the sizing module screen. The trading module updates any information in an initialization step 72.

The trading module provides a screen (Fig. 11) in which the user enters or updates the necessary information, step 74. The information includes the trade

date, the type of security (stock/mutual fund, future, or option), the transaction type (buy, sell, sell short, buy to cover), the symbol, the month and strike price for futures and options, the number of shares or contracts, the price of the transaction, the stop-loss price, the alert limit price, the stop expiration date, and the broker used, the commission paid per share or contract.

The trading screen also provides the user with a summary of the existing portfolio, step 76. The system is able to display the existing portfolio positions and stops and the planned risk to equity represented by the contemplated transaction for this trade and for the entire position. The system also displays the current estimated buying power and the estimated buying power after the contemplated transaction. The system also displays the current planned portfolio risk. If the trading screen is accessed directly from the screen for sizing an order, step 78, the input fields in the trading screen default to the scenario selected in the sizing screen.

Upon entry of the user's information, the system generates an "order ticket." The user must contact his/her broker/dealer to execute the trade. The user should then record the trade upon receipt of the trade confirmation from the broker. The order ticket lists the settlement date, which is generally the trade date plus three days for stocks, and the trade date plus one day for futures and options, accounting for holidays. The system also determines the actual expense for the transaction. The system allows the user to submit the order ticket for recording after the appropriate

information has been entered, or to cancel the transaction before submitting an order ticket, step 80.

5       The system also includes a tracking module 90, denominated "Track-It" herein, that provides the user with the ability to track the user's portfolio. See Fig. 12. Upon initialization, step 92, the tracking module updates price and equity information. The tracking module provides a screen (Fig. 13) that summarizes the status of the user's portfolio. In step 94, this screen displays  
10      the total equity, equity minus planned risk for the portfolio, the user's estimated buying power, and the user's available cash. The user is able to select various options after viewing the tracking module information, step 96.

15       The tracking screen also provides a chart or grid listing each security owned. For each security, the system lists the symbol, the number of shares or contracts, the cost basis (for example, by averaging all lots on a first in, first out basis, accounting for in  
20      and out commissions), the last price for the security, the stop price entered on the order ticket or after subsequent adjustment, the planned risk for the position divided by the portfolio's total equity, the total dollar risk of the position factoring in the planned stop and  
25      the last sale of the security, the market value (amount of shares multiplied by the last sale price), and the weighted percentage gain or loss that the position maintains. The gain or loss may be shown in percentage and in absolute dollar terms.

30       All securities with the same symbol, the same stop, and belonging to the same account are aggregated to show

a single record. The cost basis shown is the sum of the aggregated lots. If the user is viewing positions in an account, the user may adjust stops and alarms and alerts on various positions. For a particular lot (aggregated or not), the user may adjust the stop for either the entire lot or for part of the lot. In this case, the aggregated position will be displayed as two positions, because they will have different stop values. If a stop price is adjusted, the alert price is automatically changed to the stop price. The user, however, may change the alert price, preferably by a drill down to source the account wherein the instrument is located.

The user may update the last sale price for a security manually. Alternatively, the system is able to obtain updated sale prices automatically from sources accessed via the Internet or another network.

The system includes a protection module 110, denominated "Protect-It" herein, that allows the user to track and adjust the stop-loss price at any time, not simply upon submitting a trade. See Fig. 14. Upon initialization, step 112, the module updates price and equity data. The protection module displays, in step 114, a stop worksheet or screen (Fig. 15) that lists each position, its sell or buy stop as appropriate, and an expiration date for the stop. The user may update information, in step 116. For each stop, the user may input an expiration date, may indicate that the stop is a firm order until the user cancels it, and set the trading session to which the stop should be assigned, such as a regular exchange trading session or all global sessions around the world. The user may enter a broker for the

account containing the position, or may indicate that the stop is to be a mental stop. The system may display both actual and proposed positions that a user may create within the context of an active account or portfolio.

5           The system includes a report module 48 that creates various reports. The module generates a risk report that quantifies a portfolio's overall planned risk in a format readily accessible to the user, preferably in a single screen or window (Fig. 16). The risk report allows the  
10       user to see the risk with each account or portfolio for each instrument type. For portfolios, instruments of similar types are typically aggregated. For example, one record is shown for the risk associated with all equities, one record is shown for the risk associated  
15       with all futures, and so on. Referring to Fig. 16, the risk report displays equity minus risk, planned risk, planned risk divided by total equity and portfolio total equity. Links may be provided to view the risk reports of each of the accounts in that portfolio.

20           The report also displays the user's estimated buying power and a trade date cash balance in the equity portfolio. For a futures account, the system displays an amount of withdrawable funds and a prior day's ending balance. These values may be obtained from the user's  
25       futures broker or margin clerk and updated manually by the user when received.

          The system is also capable of generating a performance report over a selected period of time, such as on a daily, weekly, monthly, quarterly, or yearly  
30       basis. This report may be viewed for an account or for a portfolio. Associated indexes may also be tracked for



comparison. Simple moving averages over suitable time periods, such as ten, twenty-one, fifty, and 200 days, are also provided. The system is also capable of graphing the performance (Fig. 17), using either arithmetic or  
5 logarithmic scaling. In the preferred embodiment, performance reports utilize the VAMI (daily (period) rate of change method) to generate equity normalized graphs for the accounts and portfolios equity as well as the index comparisons.

10 The system provides an alerts and alarms module 120 that notifies the user upon the occurrence of certain events. As used in the present system, an alert is a notification of an instrument moving through its stop price, and an alarm is a notification of other events,  
15 such as the passing of expiration dates of stops or when a preselected price level is reached for a particular security. Receiving an alarm or alert enables the user to take prompt action, such as selling an instrument that has reached its stop, purchasing an instrument that has reached a certain limit price, or adjusting stops that  
20 have expired. The alert and alarm module may be accessed through protection or tracking modules.

For example, the system is able to send an alert to the user upon expiration of a stop. The system also sends  
25 an alert when a preselected price level is reached for a particular security. The user can set upper and lower limit alarms. If the last sale price touches the lower limit or moves below it, or if the last sale touches the upper limit or moves above it, the system automatically  
30 sends an alert to the user.

Other alerts or alarms or messages may be provided. For example, the user may receive information regarding stock splits, brokerage house merges, stock merges or consolidation and futures gearing adjustments.

5           In a calculator and tools module 130, the system provides the user access to various decision support tools. Typically, the system provides a stock options calculator, a futures calculator, and an index calculator.

10           The system's options calculator (Fig. 18) allows the user to calculate theoretical value, implied volatility, and other pertinent values used when investing in options. These calculations help the user form a judgment on whether the option is overpriced or underpriced and  
15           several significant values that effect an option's pricing.

Referring also to Fig. 8, in step 134, the option calculator (Fig. 18) can be called from the sizing module 132. The system provides the option type (stock, future,  
20           currency, or index) and symbol, the market price (for example, spot price for stock), and the exercise or strike price. The system also provides the maturity or number of days until the option may be exercised. The system preferably automatically calculates the day (the  
25           third Friday of the month expiration date) based on the entered month and year. These values may be obtained from an outside data provider. The user is also able to manually override them.

30           The system user also provides the simple risk-free interest rate for the period. This rate is typically a T-bill rate, and may be entered directly by the user or

obtained as a default value from a T-bill rate table for the appropriate country. This rate is defined as the risk free interest the user will receive for the amount for the period between the current date and the exercise date.

The system provides a forecast for the price volatility of the security, or the volatility of the underlying stock may be obtained from a data service provider. If implied volatility is to be calculated, the system also provides the actual market price of the option. This value may also be defaulted for options on global securities from a data service provider. The user is able to override these values if desired.

The system may also provide dividends (date paid and amount), if the user would like to adjust the results to account for dividends that will be paid during the period until maturity. The system takes these future cash flows and adjusts them to a present value, which is utilized in developing the theoretical value of the option. The system uses the adjusted Black-Scholes formula, which requires entry of the number of days until the last dividend is paid. It will be appreciated that other formulas, such as Dodge and Cox, may be used.

Upon entry of the required data, the system determines and displays, in steps 136 and 138, the theoretical price, implied volatility and all other "Greek" calculations of the put or call option (Delta, Gamma, Vega, Theta, and Rho). For index options, the system includes a worksheet for maintaining data relating to the securities in and the index divisor associated with the index of interest.

The calculator and tools module 130 also provides a futures calculator that allows the user to evaluate the theoretical value of a futures contract. The user inputs the symbol of the future, the futures month code for the  
5 futures contract, the current spot market price of the cash market underlying the futures, and the T-bill rate as the risk free interest rate the user receives for the amount for the period between the current date and the exercise date. This last value may be defaulted from the  
10 T-bill rate table for the appropriate country. The user is then able to view the theoretical price for a given future and its maturity month.

The calculator and tools module 130 also provides an index options calculator. This calculator calculates  
15 theoretical value, implied volatility, and the Greeks (Delta, Gamma, Vega, Theta, and Rho) for a given index. These calculations help a user judge whether the option is overpriced or underpriced and provide several values that effect an option's pricing. The user enters the  
20 index symbol, the option codes, whether for a call or a put, the exercise month and the strike price. The index name may be entered automatically from a data service provider or the user may select the name from an index list. The price divisor for the index is typically  
25 defaulted from a data service provider or the exchange directly, but the user may change it. The index price (spot market) is the current market price of the underlying cash (spot) index. This value may be defaulted from a data service provided. The T-bill rate is the risk  
30 free interest rate the user will receive for the amount for the period between the current date and the exercise

date. This value may be defaulted from the T-bill rate table for the appropriate country. The volatility of the security may be obtained from a data service provider. Similarly, the market price of the option is defaulted for the index options provided by a data provider. Optionally, the user may change this value or enter a new one.

The system includes other useful tools, such as a symbol look up table to look up stock/mutual fund, stock option, futures, and futures option symbols that are traded in local as well as international exchanges. The system provides the capability to obtain real time price quotes for symbols listed on local and international exchanges from a data service provider. Users may also watch certain stocks and track stops without setting up an account for those stocks.

The system also provides a broker look up table, a currency conversion table, futures gearing listed in relevant exchanges, the risk free 30-day bill rate for a particular country, and holiday lists for exchanges in a particular country. Users are able to maintain a list of private symbols, in which the user transacts, such as bonds.

The system provides other functionalities as well. For example, the system is capable of displaying a trade register or blotter 140, which provides a centralized data collection for daily transactions. See Figs. 19 and 20. The user may move forward or backward one day at a time or may enter a date to jump directly to that date. A trade date drop down menu may be provided to allow the

user to select from all of the dates on which a trade occurred.

5 The system is capable of displaying information in other formats as well. For example, the user may select a period of time over which to view transactions. The user may filter by specific securities, size risk, brokers, or SIC code. The user may select one or more accounts to view. The use can select sorting criteria for the transactions shown on the basis of date, account, broker, 10 symbol or size.

The system may also provide educational content. For example, the system may include multimedia presentations of terminology, concepts and strategies; Frequently Asked Questions (FAQs); and forms-based, context-sensitive 15 tool-tip-like hints. The system may also provide the facility for moderated chats. Users may receive help regarding usage of the system in chat sessions. In addition, users may also chat among themselves.

On completion of the registration process, 20 registered users may be set up with "private" sample accounts, one each for equities, futures, and other instruments, such as bonds and mortgages. A sample portfolio, which is a combination of the above accounts, may also be set up. The sample accounts provide the user 25 with "experimental" material that complements the information in on-line tutorials and serves as a learning tool. Users may perform transactions, such as sizing, alerts, and reports, on the sample accounts and portfolio. However, these transactions are not 30 persistent. The contents of the sample accounts and portfolio match the content in the educational material.

Referring to Fig. 21, in the client/server context, maintenance services are preformed to maintain information. The various maintenance tasks include managing a broker list, stock splits, symbol changes, system schedules, users, holiday lists for various countries, broker consolidations, T-bill rates, currency exchange rates, futures gearing, equity runs, and login administration. Figs. 27, 28, and 29 illustrate various exemplary screens that provide editing and maintenance functionalities.

Those skilled in the art should readily appreciate that the programs defining the functions and modules of the present invention can be delivered to a computer in many forms, including, but not limited to: (a) application service program via the World Wide Web; (b) information permanently stored on non-writable storage media (for example, read only memory devices within a computer such as ROM or CD-ROM disks readable by a computer I/O attachment); (c) information alterably stored on writable storage media (for example, floppy disks and hard drives); or (d) information conveyed to a computer through communication media for example using baseband signaling or broadband signaling techniques, including carrier wave signaling techniques, such as over computer or telephone networks via a modem. In addition, while the invention may be embodied in computer software, the functions necessary to implement the invention may alternatively be embodied in part or in whole using hardware components such as Application Specific Integrated Circuits or other hardware, or some combination of hardware components and software.

While the invention is described through the above exemplary embodiments, it will be understood by those of ordinary skill in the art that modification to and variation of the illustrated embodiments may be made without departing from the inventive concepts herein discloses. Specifically, while the preferred embodiments are discloses with reference to use within a client/server context, the present invention is generally applicable to any other context, such as a stand along application. Moreover, while the preferred embodiments are described in connection with various illustrative data structures, one skilled in the art will recognize that the system may be embodied using a variety of specific data structures. Accordingly, the invention is not to be limited by what has been particularly shown and described, except as indicated by the appended claims.



## CLAIMS

What is claimed is:

- 5        1.    A method for managing portfolio risk on a computer system, comprising:
- storing a plurality of parameters associated with an investment instrument on a computer-readable medium, the parameters including an identifier, a market price, a
- 10       stop-loss price, and a number of shares or contracts;
- storing an equity value associated with a portfolio;
- determining a point risk value, the point risk value comprising an intermediate value multiplied by the number of shares or contracts, the intermediate value comprising
- 15       the market price minus the stop-loss price for a long transaction or the market price plus the stop-loss price for a short transaction;
- determining a number of shares or contracts associated with the point risk value for a selected size
- 20       risk value, the number determined by multiplying the selected size risk value by the equity value and dividing by the point risk value;
- repeating the step of determining a number of shares or contracts for a plurality of selected size risk
- 25       values; and
- displaying a plurality of risk scenarios corresponding to the plurality of selected size risk values, the displaying step including displaying the number of shares or contracts corresponding to each of
- 30       the plurality of size risk values.

2. The method of claim 1, further comprising:  
determining a market value associated with each of  
the plurality of risk scenarios and  
displaying the market values.
- 5
3. The method of claim 1, further comprising:  
storing the plurality of parameters associated with  
a plurality of investment instruments;  
storing a total equity value for the portfolio;  
10 determining for each investment instrument a risk  
value, the risk value comprising an intermediate value of  
the market price minus the stop-loss price for a long  
transaction or the market price plus the stop-loss price  
for a short transaction, the intermediate value  
15 multiplied by the number of shares or contracts  
associated with each investment instrument;  
determining a sum of risk values of the plurality of  
investment instruments, the sum comprising a planned risk  
value;  
20 determining the equity value by subtracting the  
planned risk value from the total equity value for the  
portfolio; and  
displaying the equity value.
- 25
4. The method of claim 1, further comprising:  
determining a ratio of the planned risk value to the  
total equity value; and  
displaying the ratio.
- 30
5. The method of claim 1, further comprising:  
storing a user's buying power value; and

displaying the user's buying power value.

6. The method of claim 5, further comprising:

5 determining a plurality of market values, each  
market value associated with each of the plurality of  
risk scenarios; and

10 displaying a plurality of new buying power values,  
each new buying power value corresponding to the user's  
buying power minus each of the plurality of market  
values.

7. The method of claim 1, further comprising:

15 storing a commission and a skid associated with the  
investment; and  
in the step of determining the point risk, the  
intermediate value comprises the market price minus the  
stop-loss price plus the commission plus the skid for a  
long transaction, or the intermediate value comprises the  
20 market price plus the stop-loss price minus the  
commission minus the skid for a short transaction.

8. The method of claim 1, wherein the investment  
instruments includes stocks, mutual funds, options,  
futures, futures options, bonds, or mortgages.

25

9. The method of claim 1, wherein the computer system  
comprises a client/server computer system.

30 10. A system for managing investment portfolio risk on a  
computer system, comprising:  
at least one processor;

at least one memory, the memory containing a plurality of parameters associated with an investment instrument on a computer-readable medium, the parameters including an identifier, a market price, a stop-loss price, a number of shares or contracts, and an equity value associated with a portfolio; and

a utility executable by the at least one processor and operable to:

determine a point risk value, the point risk value comprising an intermediate value multiplied by the number of shares or contracts, the intermediate value comprising the market price minus the stop-loss price for a long transaction or the market price plus the stop-loss price for a short transaction,

determine a number of shares or contracts associated with the point risk value for a selected size risk value, the number determined by multiplying the selected size risk value by the equity value and dividing by the point risk value,

repeat the step of determining a number of shares or contracts for a plurality of selected size risk values, and

display a plurality of risk scenarios corresponding to the plurality of selected size risk values, the displaying step including displaying the number of shares or contracts corresponding to each of the plurality of size risk values.

11. The system of claim 10, wherein the utility is further operable to determine a market value associated

with each of the plurality of risk scenarios and display the market values.

12. The system method of claim 10, wherein further comprising:

the memory further contains the plurality of parameters associated with a plurality of investment instruments and a total equity value for the portfolio; and

the utility is further operable to:

determine for each investment instrument a risk value, the risk value comprising an intermediate value of the market price minus the stop-loss price for a long transaction or the market price plus the stop-loss price for a short transaction, the intermediate value multiplied by the number of shares or contracts associated with each investment instrument,

determine a sum of risk values of the plurality of investment instruments, the sum comprising a planned risk value,

determine the equity value by subtracting the planned risk value from the total equity value for the portfolio, and

display the equity value.

13. The system of claim 10, wherein the utility is further operable to determine a ratio of the planned risk value to the total equity value and display the ratio.

30

14. The system of claim 10, wherein:

the memory further contains a user's buying power value; and

the utility is further operable to display the user's buying power value.

5

15. The system method of claim 14, wherein the utility is further operable to:

determine a plurality of market values, each market value associated with each of the plurality of risk scenarios; and

10

display a plurality of new buying power values, each new buying power value corresponding to the user's buying power minus each of the plurality of market values.

15 16. The system of claim 10, wherein:

the memory contains a commission and a skid associated with the investment; and

the utility is operable to determine the point risk, the intermediate value comprising the market price minus the stop-loss price plus the commission plus the skid for a long transaction, or the intermediate value comprises the market price plus the stop-loss price minus the commission minus the skid for a short transaction.

20

25 17. The system of claim 10, wherein the investment instruments includes stocks, mutual funds, options, futures, futures options, bonds, or mortgages.

30 18. The system of claim 10, wherein the computer system comprises a client/server computer system.

19. A computer program product including a computer readable medium, said computer readable medium having a computer program stored thereon, said program comprising:

5       program code for storing the plurality of parameters associated with a plurality of investment instruments;

      program code for storing a total equity value for the portfolio;

      program code for determining for each investment instrument a risk value, the risk value comprising an  
10   intermediate value of the market price minus the stop-loss price for a long transaction or the market price plus the stop-loss price for a short transaction, the intermediate value multiplied by the number of shares or contracts associated with each investment instrument;

15       program code for determining a sum of risk values of the plurality of investment instruments, the sum comprising a planned risk value;

      program code for determining the equity value by subtracting the planned risk value from the total equity  
20   value for the portfolio; and

      program code for displaying the equity value.

20. A system for managing portfolio risk on a computer system, comprising:

25       means for storing the plurality of parameters associated with a plurality of investment instruments;

      program code for storing a total equity value for the portfolio;

      means for determining for each investment instrument  
30   a risk value, the risk value comprising an intermediate value of the market price minus the stop-loss price for a

long transaction or the market price plus the stop-loss price for a short transaction, the intermediate value multiplied by the number of shares or contracts associated with each investment instrument;

5 means for determining a sum of risk values of the plurality of investment instruments, the sum comprising a planned risk value;

means for determining the equity value by subtracting the planned risk value from the total equity value for the portfolio; and

10 means for displaying the equity value.

21. A computer data signal embodied in a carrier wave, said computer data signal including a computer program, said computer program comprising:

15 program code for storing the plurality of parameters associated with a plurality of investment instruments;

program code for storing a total equity value for the portfolio;

20 program code for determining for each investment instrument a risk value, the risk value comprising an intermediate value of the market price minus the stop-loss price for a long transaction or the market price plus the stop-loss price for a short transaction, the intermediate value multiplied by the number of shares or contracts associated with each investment instrument;

25 program code for determining a sum of risk values of the plurality of investment instruments, the sum comprising a planned risk value;



program code for determining the equity value by subtracting the planned risk value from the total equity value for the portfolio; and

program code for displaying the equity value.

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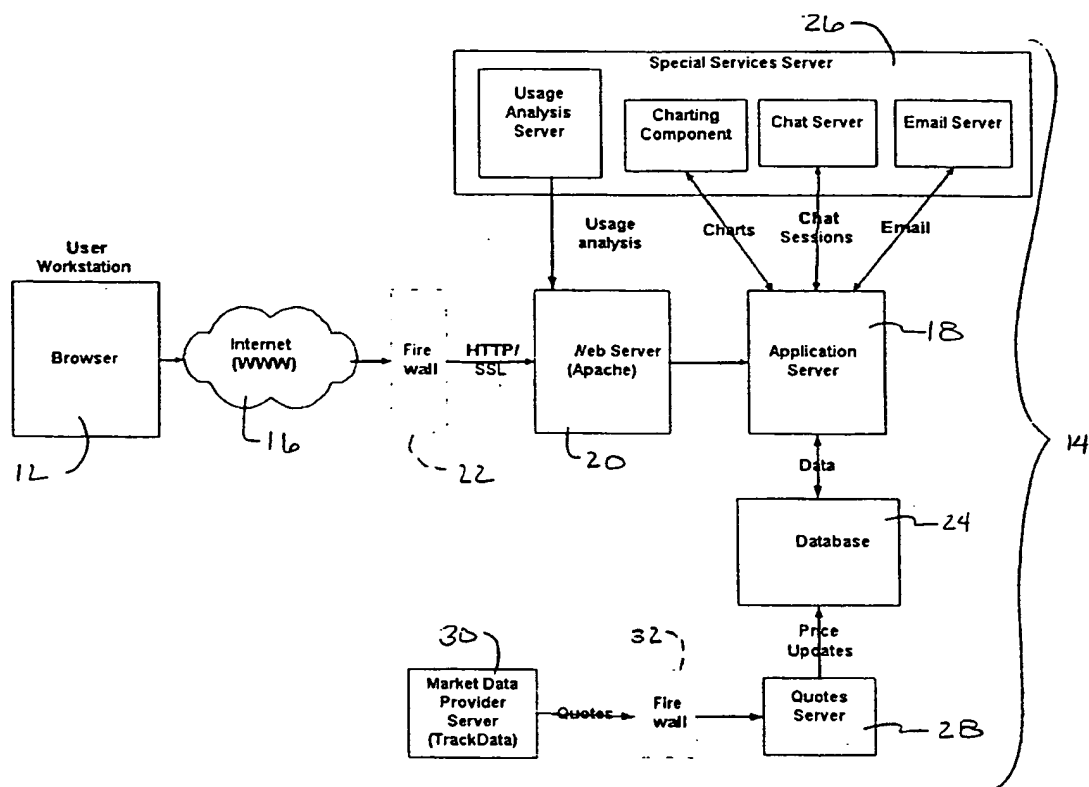


FIG. 1: SYSTEM ARCHITECTURE

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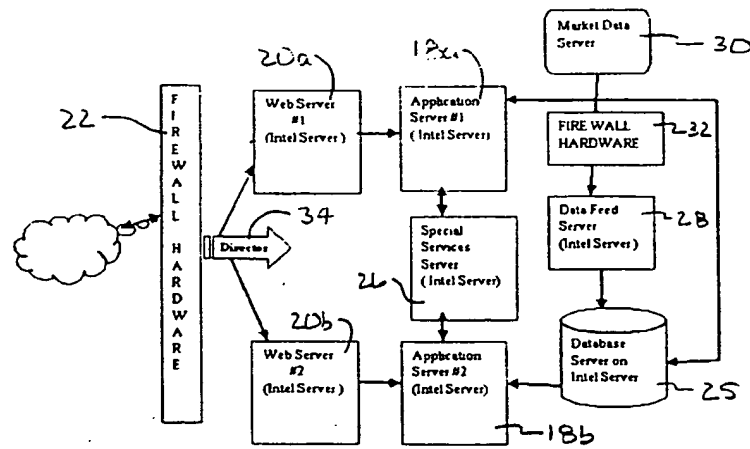


Fig. 2: Physical Deployment of System - Web Farm

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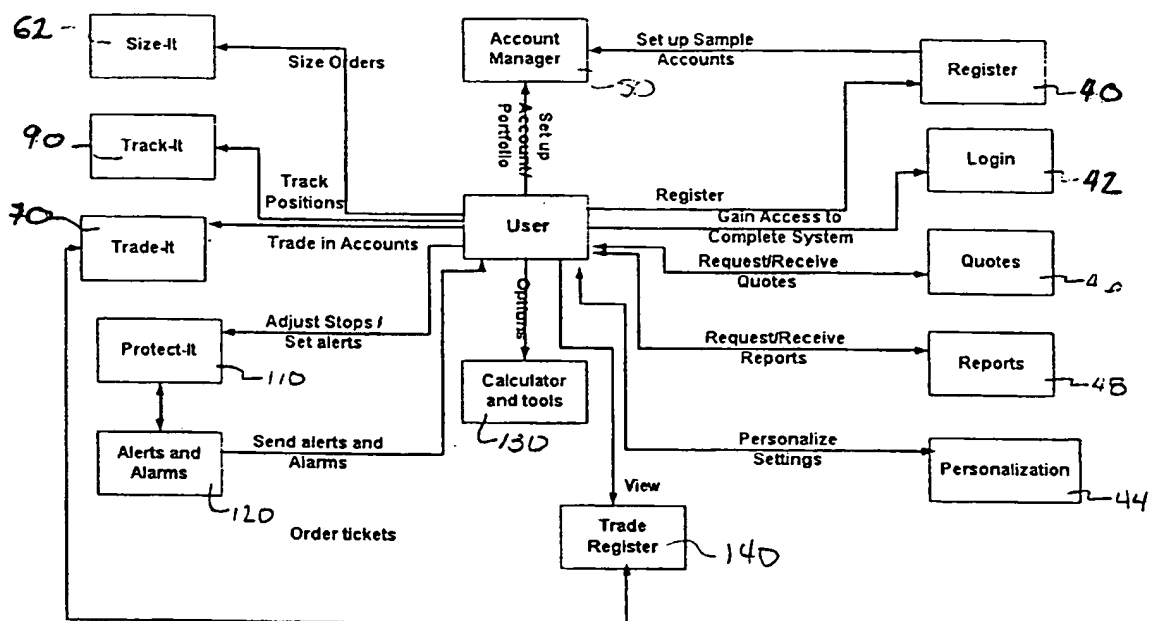


Fig. 3: System Packages

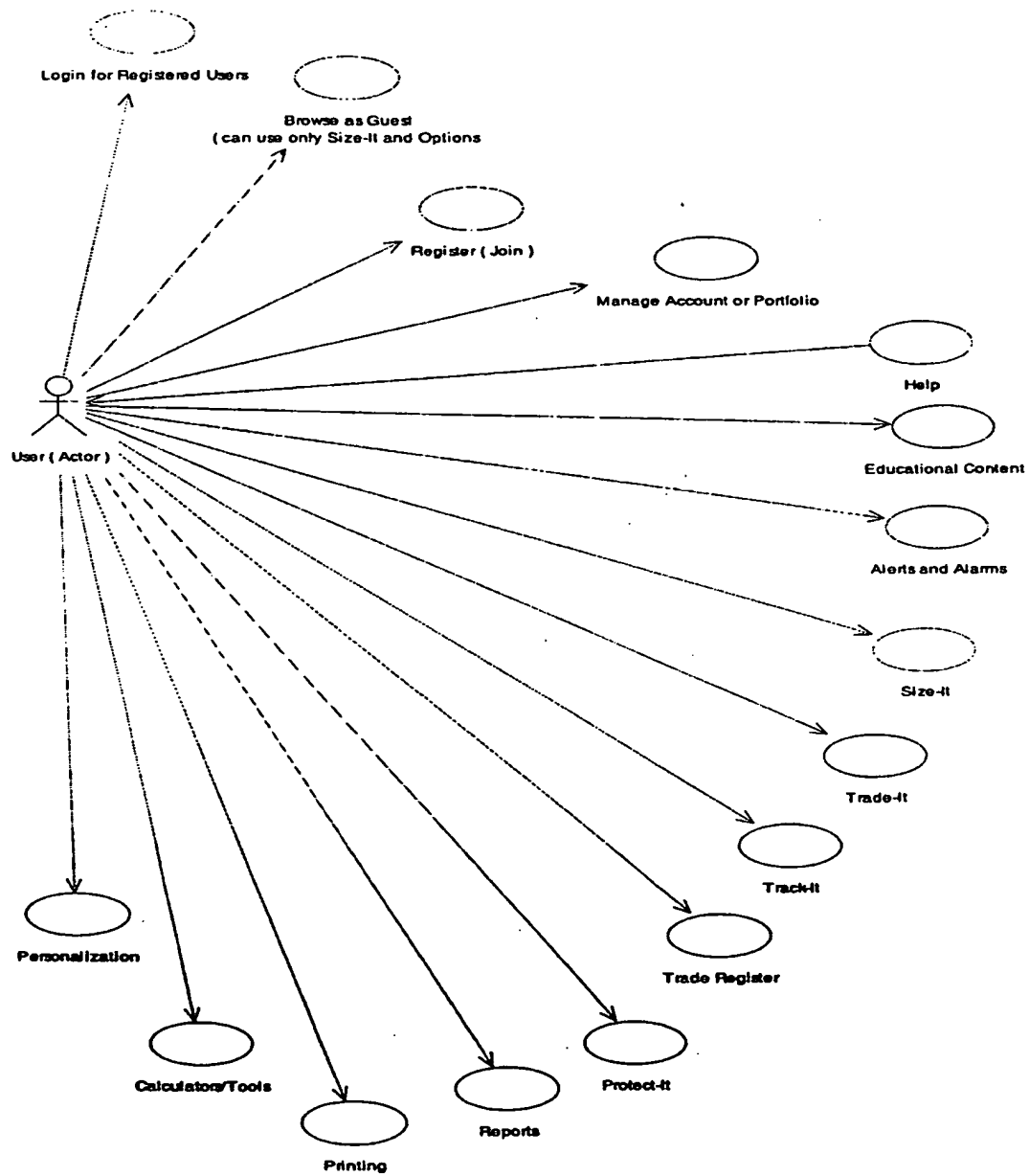


Fig. 4 : Services for the user level

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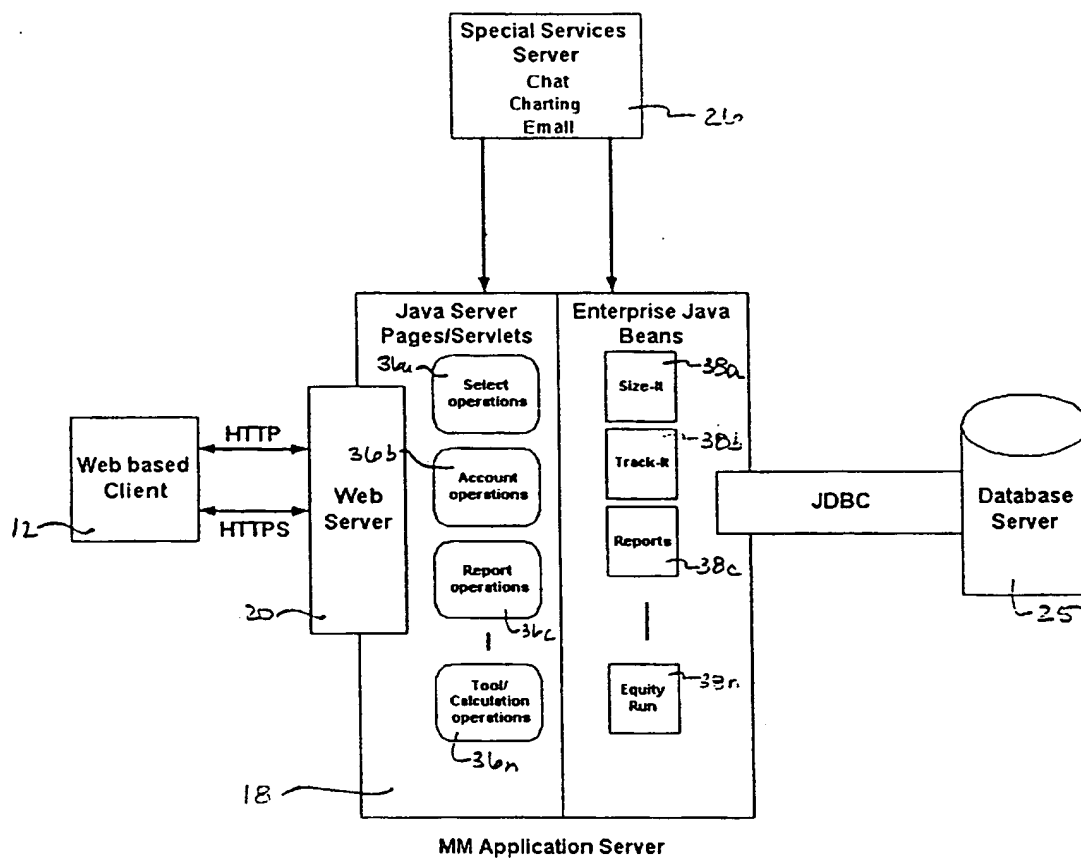


Fig. 5: Logical Deployment of System

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Figure 6

The screenshot displays the MoneyMaximizer website within a Netscape browser window. The browser's address bar shows the URL <http://www.moneymaximizer.com>. The website's header includes a navigation menu with links: Home, Education, Tools, Log Out, Maintenance, Help, Reference, Feedback, Performance Report, Risk Report, Trade Register, Calculators, Size-It, Trade-It, Track-It, Protect-It, and Risk Report. A secondary menu on the right includes Risk Report, Alerts, and Quote. The main content area features a welcome message and a table of account statistics.

| MoneyMaximizer®  |            |
|--|------------|
| Scalpers for Investors   |            |
| <a href="http://www.moneymaximizer.com">www.moneymaximizer.com</a> |            |
| Equity   | 49990.3984 |
| R to E %   | 3.04       |
| Planned Risk   | 1518.6653  |
| Cash   | 83286.65   |
| Risk-Adj Equity  | 48481.34   |
| Buying Power   | 86574.0    |

Click for more detailed Risk Report

People may tell you what and when to buy. Who tells you how much to buy, or when to sell? Capital preservation and determining how much to buy and when to sell have as much impact as choice and timing.

Size-It® is where the process of money management and risk assessment begins. MoneyMaximizer® helps you to determine how many stock shares, mutual fund shares, futures contracts and option contracts to buy or sell.

MoneyMaximizer's® also provides a Derivatives Calculator so you can quickly evaluate the market price of an option, future, or index contract before investing.

Size-It® will automatically link you to Trade-It®, Track-It®, and Protect-It®.

For additional information at anytime, feel free to click the help button found on each page. MoneyMaximizer's full description and help will make your journey through the process of money management and risk assessment easier.

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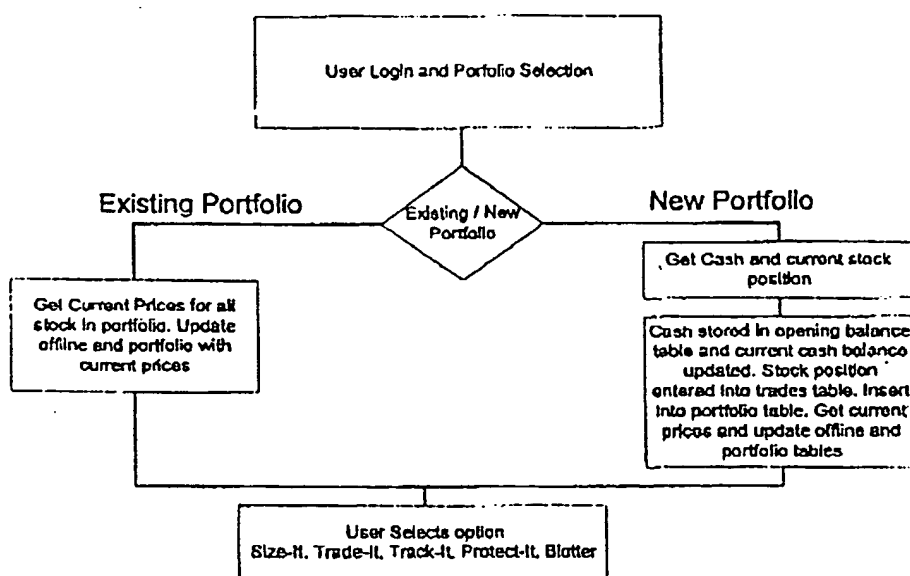


FIG 7



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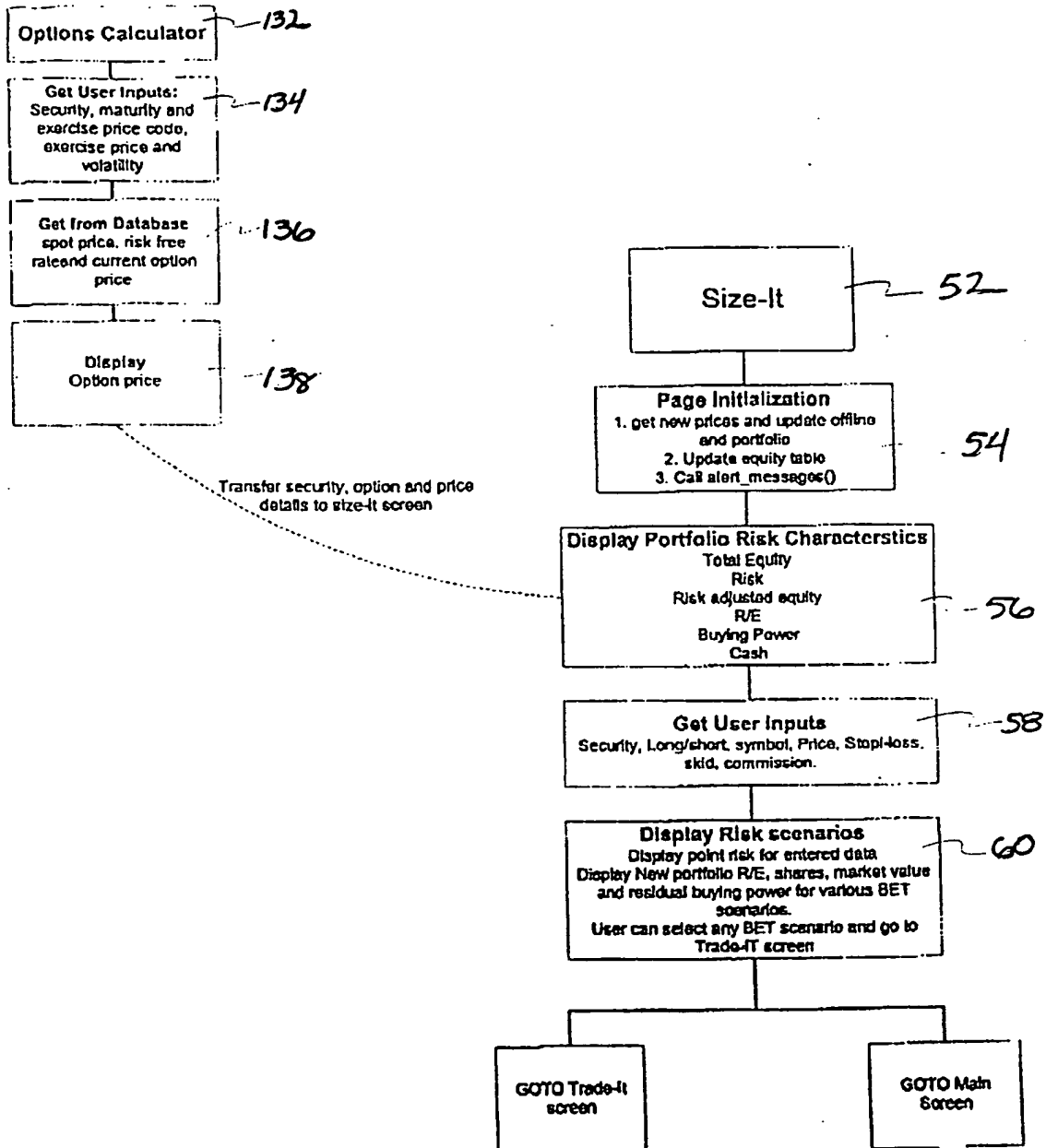


FIG. 8

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Figure 9

**Sizing your Order - testing**

**Size-It™**

Security: **Stock MF**

Sizing: **Long**

Symbol: **IBM**

Price: **108.500000**

Stop: **90.000000**

Skid: **1.000**

Commission: **0.181**

Point Risk: **19.681000**

Equity Planned: **361,970.05**

Risk: **1.43%**

PE: **11.33**

Risk to Position: **0.00%**

Buying Power: **102,375.00**

Cash: **50,000.00**

**IBM International Business Machines**

| New R/E | Size % Risk | Shares | Market Value | Buy Power |
|---------|-------------|--------|--------------|-----------|
| 4.18%   | 2.75%       | 87     | \$9,439      | 103,435   |
| 4.43%   | 3.00%       | 94     | \$10,199     | 102,676   |
| 4.68%   | 3.25%       | 102    | \$11,067     | 101,808   |
| 4.93%   | 3.50%       | 110    | \$11,935     | 100,940   |
| 5.18%   | 3.75%       | 118    | \$12,803     | 100,072   |
| 5.43%   | 4.00%       | 126    | \$13,671     | 99,204    |
| 5.68%   | 4.25%       | 134    | \$14,539     | 98,336    |
| 5.93%   | 4.50%       | 142    | \$15,407     | 97,468    |
| 6.18%   | 4.75%       | 150    | \$16,275     | 96,600    |
| 6.43%   | 5.00%       | 157    | \$17,034     | 95,840    |
| 7.43%   | 6.00%       | 189    | \$20,506     | 92,368    |
| 8.43%   | 7.00%       | 220    | \$23,870     | 89,005    |
| 9.43%   | 8.00%       | 252    | \$27,342     | 85,533    |
| 10.43%  | 9.00%       | 283    | \$30,705     | 82,169    |
| 11.43%  | 10.00%      | 315    | \$34,177     | 78,697    |
| 13.93%  | 12.50%      | 394    | \$42,749     | 70,126    |
| 16.43%  | 15.00%      | 472    | \$51,212     | 61,663    |
| 18.93%  | 17.50%      | 551    | \$59,783     | 53,091    |
| 21.43%  | 20.00%      | 630    | \$68,355     | 44,520    |

**Print** **Clear**

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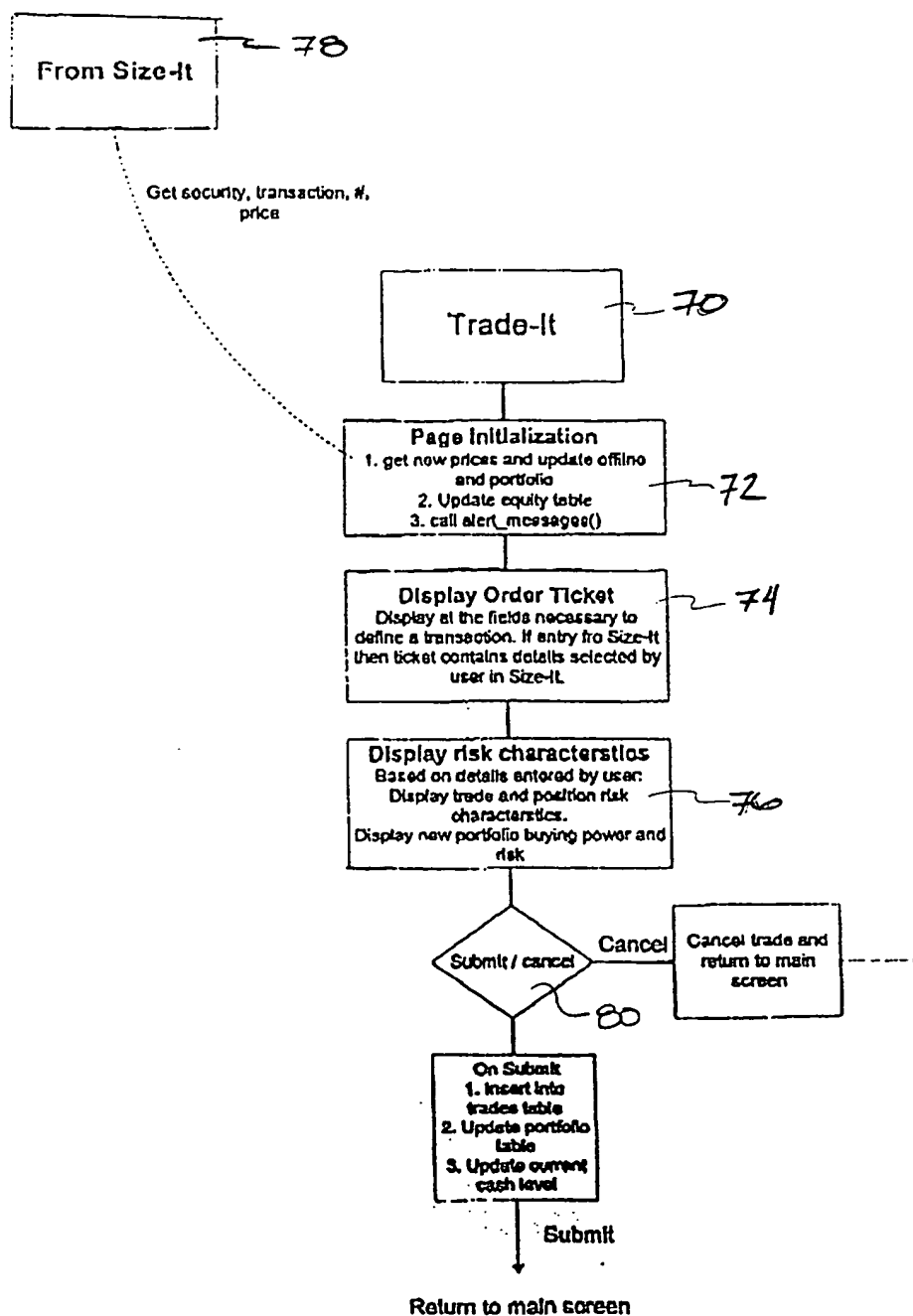


FIG. 10

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Figure 11

Order Ticket - testing

**Trade-It™**  
Order Ticket

Trade Date: 06/04/2000 Time: 22:58  
Settle Date: 06/07/2000

SIFID: Stock/MF Transaction: Buy

Symbol: IBM Shares: 102 Price: 106.50000  
IBM International Business Machines Cost: \$10,881.46

Stop: 90.00000 Alert: 95.00000 Stop Expires On: 07/04/2000

Broker: JCS Commission per Shr: 0.18098 Lump Sum: 18.46

Limit Alarm: Lower 92.00000 Upper 115.00000 Any Cr

---

Portfolio: NO POSITIONS FOUND

Positions/Stops:

| Risk to | Trade | Position |
|---------|-------|----------|
| Equity  | 241%  | 31706    |

Your Current Buying Power is: \$102,375.00  
Your New Buying Power Will Be: \$101,976.08  
Your Current Portfolio Risk is: 11.44%

Print Submit Cancel

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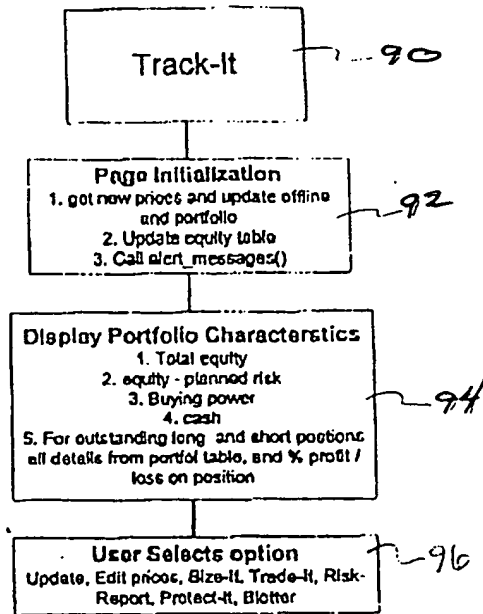


FIG. 12

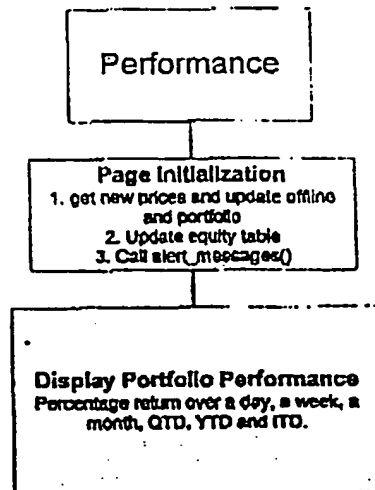
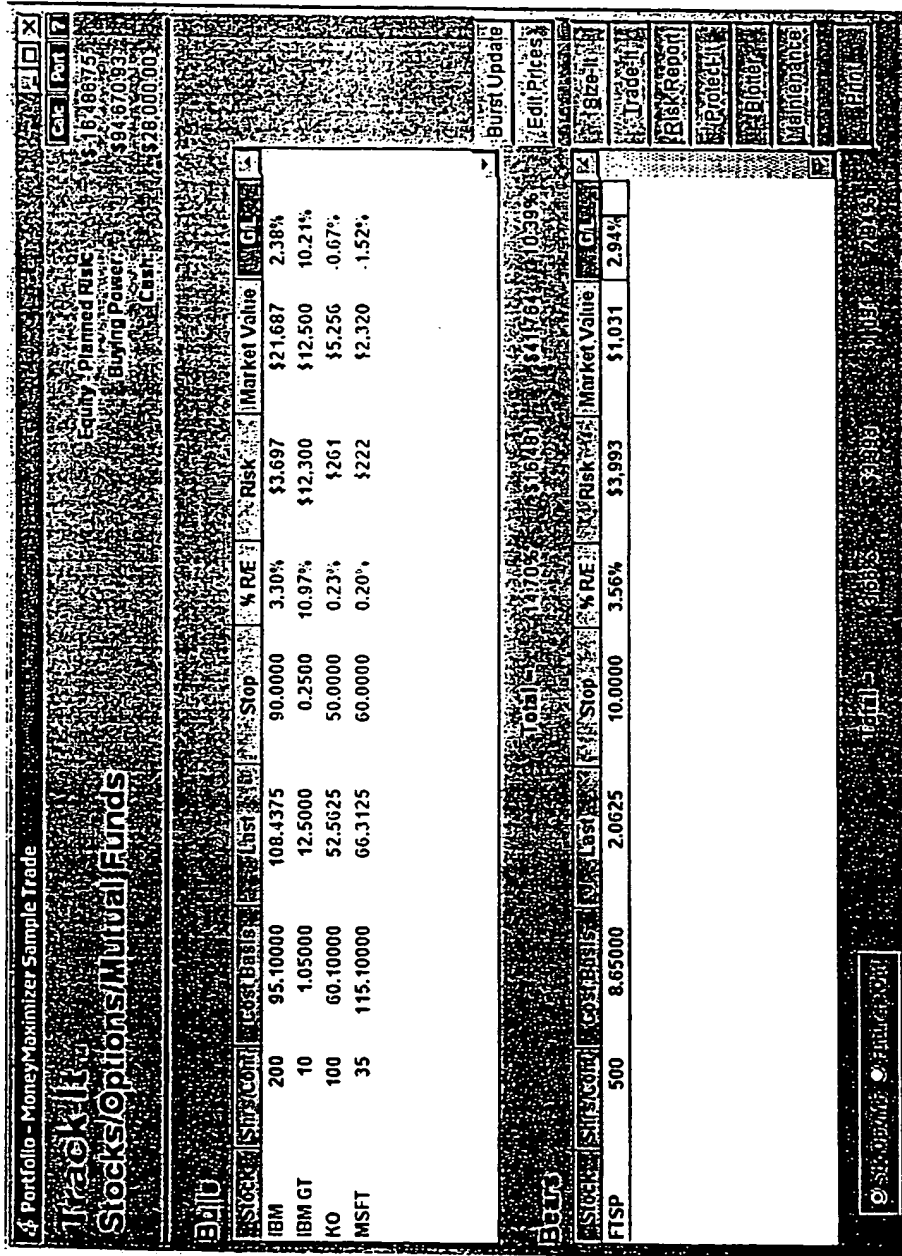


FIG. 17A

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Figure 13



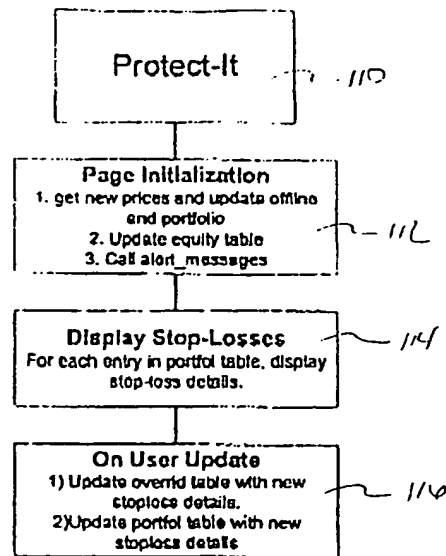


FIG. 14

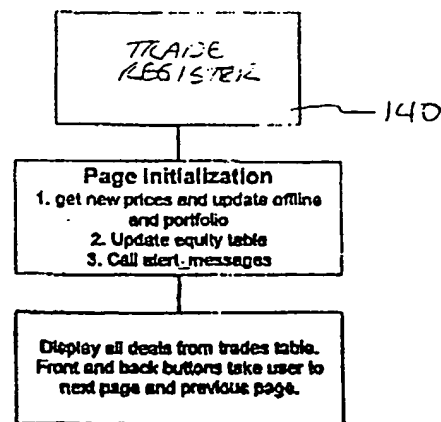


FIG. 19

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Figure 15

**Stop Reporting - MoneyMaximizer Sample Trade**

**Protect It** To Adjust Stop, Broker or Session, on a portfolio position, double click on the stop. Return to your portfolio screen to split or delete the stop. Have a trial!

| Symbol   | Name                          | Shares | Symbol | Buy Stop   | Sell Stop  | Broker | Session | Expiry   |
|----------|-------------------------------|--------|--------|------------|------------|--------|---------|----------|
| CVS STOP | First Team Sports Inc         | 500    | FTSP   | 10.000000  | 10.000000  | MENT   | REG     | 01/01/99 |
| SEL STOP | IBM International Business    | 200    | IBEM   | 2.500000   | 2.500000   | MENT   | REG     | 01/01/99 |
| SEL STOP | G Jd - IBM International Busi | 10     | IBMG   | 10.000000  | 10.000000  | MENT   | REG     | 01/01/99 |
| SEL STOP | Coca Cola Co                  | 100    | KO     | 150.000000 | 150.000000 | MENT   | REG     | 01/01/99 |
| SEL STOP | Microsoft Corp                | 35     | MSFT   | 150.000000 | 150.000000 | MENT   | REG     | 01/02/02 |

**Add Contingent Order** **Delete Contingent**

| Symbol   | Name                      | Symbol | Contracts | Buy Stop   | Sell Stop  | Broker | Session | Expiry   |
|----------|---------------------------|--------|-----------|------------|------------|--------|---------|----------|
| SEL STOP | Crude Oil Light Sweet     | @CL U  | 1         | 18.000000  | 18.000000  | MENT   | REG     | 01/01/99 |
| SEL STOP | Cotton No. 2              | @CT V  | 5         | 2.850000   | 2.850000   | MENT   | REG     | 01/01/99 |
| SEL STOP | U.S. Dollar Index (FINEX) | @DX U  | 2         | 92.500000  | 92.500000  | MENT   | REG     | 01/01/99 |
| BUY STOP | U.S. Treasury Bond 30 Yr. | @US U  | 2         | 115.000000 | 115.000000 | MENT   | REG     | 01/01/99 |

Double Click on stop to change

**Add Contingent Order** **Delete Contingent** **Print Report**



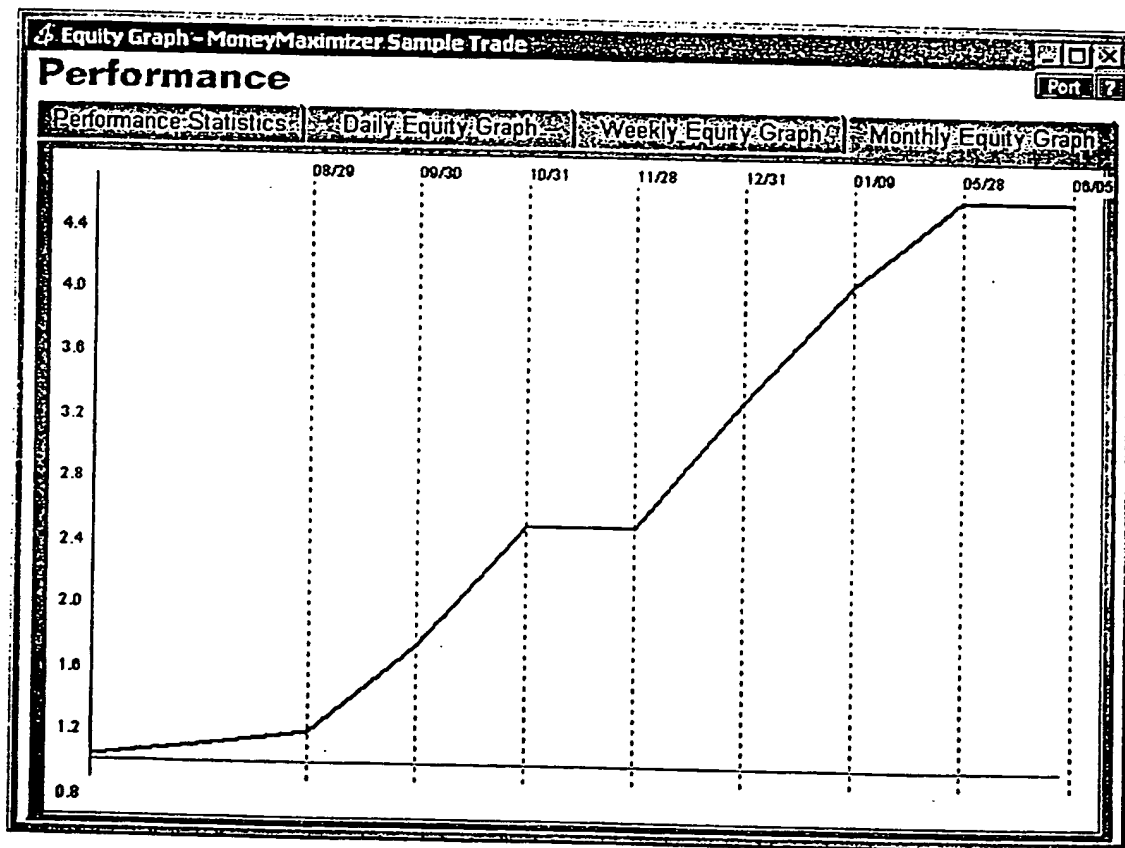
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Figure 16

| Risk Report - MoneyMaximizer Sample Trade |             |             |            |         |
|---|-------------|-------------|------------|---------|
|   |             |             |            |         |
| TOTAL                                     |             | STOCKS/MF   | FUTURES    | OPTIONS |
| Equity-Risk                               | \$46,233.25 |             |            |         |
| Planned Risk:                             | \$8,726.75  | \$4,996.75  | \$3,730.00 | \$0.00  |
| R/E %:                                    | 15.88%      | 9.09%       | 6.79%      | 0.00%   |
| Equity:                                   | \$54,960.00 | \$54,725.00 | \$235.00   |         |
| Est. Buying Power:                        | \$75,775.00 |             |            |         |
| TRADE DATE BALANCE:                       |             | \$28,050.00 |            |         |
| WITHDRAWABLE FUNDS:                       |             |             | \$1,000.00 |         |
| ENDING BALANCE:                           |             |             | \$1,000.00 |         |
| << Off Line >>                            |             |             |            |         |
| Print                                     |             |             |            |         |

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Figure 17



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Figure 18

**Theoretical Option Price Calculator**

Option Type ☒ Stock ☐ Future ☐ Currency ☐ Index

Spot Price  Exercise price

Maturity - Month  Year  →  Days

Rate  Volatility

Index: Name  Add/Edit... Divisor

To Calculate Implied Volatility, Enter Market Price

| Enter Dividends |      | Call Results | Put Results |
|-----------------|------|--------------|-------------|
|                 | Date | Amount       |             |
| Enter up to 5   | 1    | 0.0000       |             |
| dividends to    | 2    | 0.0000       |             |
| be paid         | 3    | 0.0000       |             |
| between         | 4    | 0.0000       |             |
| now and the     | 5    | 0.0000       |             |
| maturity        |      |              |             |
| date:           |      |              |             |





(74) Anwalt: MAIWALD, Walter; Maiwald Patentanwalts GmbH, Elisenhof, Elisenstrasse 3, 80335 München (DE).

(BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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**Veröffentlicht:**

- Mit internationalem Recherchenbericht.
- Vor Ablauf der für Änderungen der Ansprüche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eintreffen.

(88) Veröffentlichungsdatum des internationalen Recherchenberichts:

10. Mai 2001

(84) Bestimmungsstaaten (*regional*): ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI-Patent

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/08516

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G07F7/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G07F G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | WO 98 54677 A (FAITH PATRICK L ;SIEGEL KEVIN P (US); VISA INT SERVICE ASS (US); W) 3 December 1998 (1998-12-03)<br>page 5, line 21 -page 7, line 21<br>page 9, line 16 -page 17, line 2; claims;<br>figures<br>--- | 1                     |
| X          | WO 98 54667 A (BASCH CATHERINE A ;FAITH PATRICK (US); SIEGEL KEVIN (US); BRUESEWI) 3 December 1998 (1998-12-03)<br>abstract; claims; figures<br>---  | 1                     |
| X          | US 5 398 300 A (LEVEY CURT A) 14 March 1995 (1995-03-14)<br>the whole document<br>---  | 1-3                   |
| -/--       |  |                       |

☒ Further documents are listed in the continuation of box C.

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

28 February 2001

Date of mailing of the international search report

13/03/2001

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NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Guivol, O

# *Don't Be Out-Scored by Your Competition*

*By: Michael Banasiak*

## ***Abstract***

*The advent of e-commerce and the prospect of seamless integration along the order-to-cash continuum is making unprecedented demands upon the commercial credit fraternity. While most credit departments operate in an environment that is a collage of both paper-based and automated systems, e-commerce is inexorably leading us to a fully automated transaction-based model. The obvious problem is how to automate the paper-based tasks. Failure to do so effectively will create bottlenecks that have the potential to greatly diminish the utility of a business-to-business (b2b) e-commerce system.*

## **The Credit Approval Bottleneck**

One area that bears scrutiny in this regard is the process whereby a new commercial account is approved for credit. Many Internet sites that give commercial customers the option of entering orders on-line fail to automate the credit approval process for new accounts. As a result, once the new customer places their initial order, it must be held up while a credit investigation is completed. In some cases, the new customer is even asked to fill out a credit application on-line, but that information might just as well be faxed to the vendor's credit department. With no way to electronically extract pertinent data from the credit application and process it through a decision-making algorithm, many credit departments will simply print out the electronic application and process it manually.

One of the early lessons learned by established firms that have developed an e-commerce outlet is that the back office processes supporting both the traditional business model and the e-commerce model need to be the same. If they aren't, there is no shared benefit between the two business models; the e-commerce initiative will evolve its own overhead structure on top of that of the existing bricks and mortar enterprise. Besides the added costs, parallel processes create unnecessary complexity, which harms productivity and places critical burdens on resources and employees. The

underlying problem for many companies, then, is not simply building a fully automated e-commerce site, but first automating the credit decision process for the traditional business in such a way that this process will also support e-commerce.

This will require a radical re-thinking of the way companies traditionally approve credit. While most credit departments can process orders from existing customers in short order, new account approval is much more problematic. It is not uncommon for the credit function to take more than 24 hours to sign off on a new customer's first order, and in some cases it can still take over a week. These hold-ups are seldom related to credit issues, but rather result from inefficient processes, heavy workloads and unnecessarily stringent review requirements. While automating or outsourcing the clerical tasks involved in new account processing will save some time, it is not enough. Only a redesigned process that is fully automated will suffice. The good news is that with proper implementation, the traditional business will most likely benefit from such a re-design in terms of increased customer satisfaction, lower costs, more sales, and a much better understanding of the receivables portfolio's risk characteristics. For these reasons, a fully automated credit approval process can also provide a competitive advantage over companies relying on traditional credit systems. However, in terms of e-commerce, a fully automated credit approval process is just part of the price of participation.

### **The Role of Credit Scoring in a Knowledge-Based Decision System**

Three components are required to manage risk in an automated world: technology, information, and a knowledge-based decision system. By itself, information is not enough. In fact, most credit departments accumulate more information than they can process. Just being on-line with a credit bureau is not sufficient to optimize automated decisioning rates because information technology does not necessarily equate to information management. Technology provides the means to efficiently manage information, but something more is needed in order to automate the decision making process. A knowledge-based decision system, such as a credit scoring model, is the mechanism that enables credit process automation to work.



### The Different Types of Credit Scoring Models

| Model      | Description   |
|------------|---|
| Commercial | Used for approving credit to new business customers<br>Used with firms that have established credit histories<br>Derived from commercial credit bureau data<br>Businesses that do not have enough information in their credit reports cannot be scored by a commercial model  |
| Blended    | Used for approving credit to new business customers<br>Used with firms (usually small) for whom the commercial credit bureaus only have limited information<br>Derived from a combination of commercial credit bureau data and the business principal's consumer credit bureau data<br>Not appropriate for firms that do not have any commercial credit history   |
| Consumer   | Used for approving credit to new business customers<br>Used with firms (usually startups or micro businesses) that do not have a commercial credit history<br>Derived solely from the business principal's consumer credit bureau data<br>Since there is no commercial credit data available, manual validation that this is a business may be required<br>The use of consumer scoring models may increase as e-commerce expands, but these need to be used carefully due to consumer credit laws |
| Behavior   | Used to review the credit of existing accounts and to set collection priorities<br>Derived from internal A/R information which may be supplemented by commercial credit bureau data<br>The most predictive and, if commercial credit bureau data is not required, the least costly  |

Commercial credit scoring models typically utilize information from a number of sources: commercial and consumer credit bureaus, business directories, credit applications, trade and bank

references, industry credit groups, historical payment records, accounts receivable trial balances, and internal customer master files. Data from the appropriate sources must be fully integrated into the credit approval process in order to formulate a “good” decision. That necessitates a strong matching algorithm that automatically pulls data from the appropriate internal or external data sources.

However, for the data to provide effective credit intelligence, it must be analyzed and the validity of decisions derived from the data must subsequently be determined. Those tasks require a well-designed customer database that provides a full understanding of each existing customer’s risk quotient. A scoring model can then be designed and validated by analyzing the historical performance of the customers in the receivables portfolio.

It should also be pointed out that over time the customer mix and risk characteristics of a receivables portfolio will change, requiring that scoring models be periodically updated. Economic factors also affect credit scoring models, which incidentally can provide a comparative advantage in a changing economic environment. In good times, credit scores can be used to increase approval rates and, in a slumping economy, to decrease losses.

Developing and implementing a scoring model, therefore, is not a static process. The accuracy of a credit model will deteriorate over time. Credit scoring will therefore always be a dynamic information management process. Moreover, having a validated credit scoring model does not guarantee the optimization of the credit decision process. Credit scores must be implemented within the context of a company’s credit policies, which also change over time. The credit environment in which the scores are used is therefore subject to validation as well.

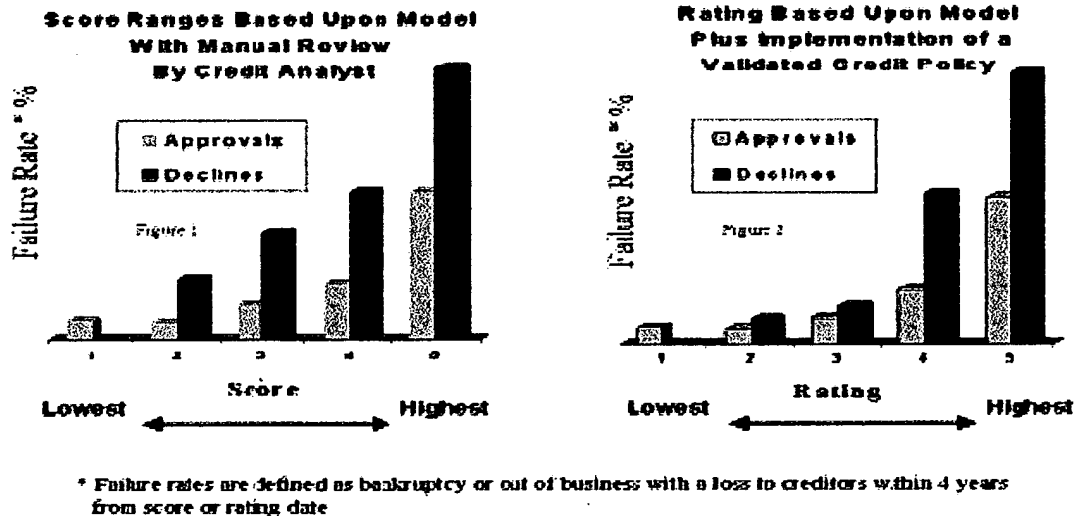
## **Validating Credit Policy**

Internet commerce demands a high percentage of “automated credit decisions” of a knowledge based decision system in order to be a useful credit tool in an e-commerce environment. Even the most ardent proponent of credit scoring would question a scoring system’s ability to make 100 percent of all credit decisions with no intervention from a credit analyst. Yet, there is a tendency by credit departments that have implemented scoring models to regularly override automated decisions. This is typically done when the credit staff lacks confidence in the quality of the automated decision or the company is under competitive sales pressure. Unfortunately, such actions tend to degrade a scoring model’s performance, both from a risk assessment standpoint and in terms of throughput. Approving open terms for low scoring accounts, the model would otherwise reject, will contribute disproportionately to delinquency and losses as these low scoring accounts perform as indicated by the model.

Even so, there is some truth to the underlying assumption that because a credit score cannot consider every factor it cannot always yield a “good” decision (this argument asserts that a competent credit analyst is a better decision-maker the more complicated the credit decision). In fact, studies have borne this out. Credit scores are very good in identifying accounts at the extremes: the lowest credit

risks and the highest credit risks. Marginal accounts are a different matter. It is here that a credit analyst following credit policy guidelines can add value to the credit decision process. The key to identifying the range of accounts where a credit analyst's input can contribute insight is in validating the corporate credit policy on top of the credit scoring model. Without the validation, credit analysts will tend to approve too many deals for low scoring accounts as was explained above. The validation process helps identify the classes of accounts that do not warrant credit analyst intervention, and help refine the criteria credit analysts should look for before overriding a credit score.

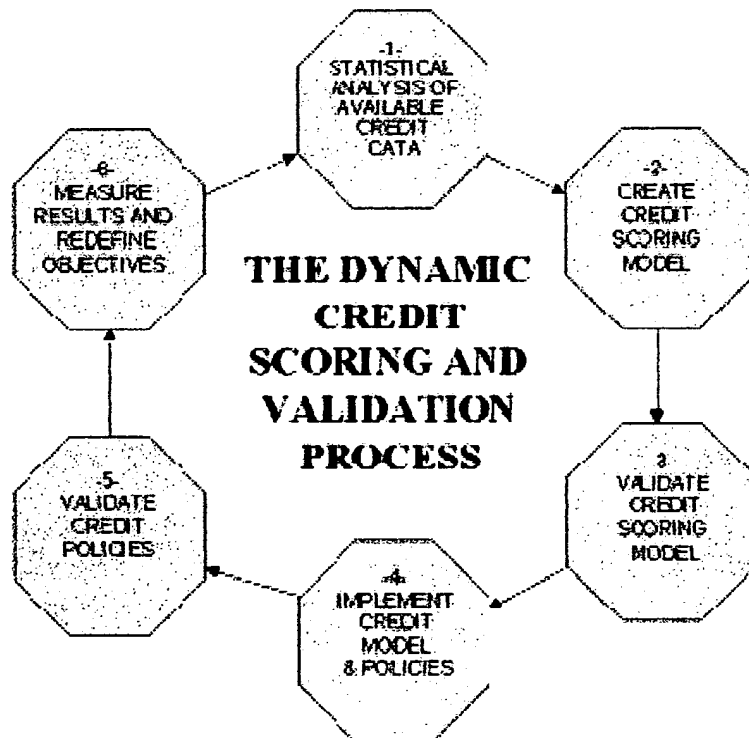
*Building an effective auto-decisioning system requires the integration of manual review by credit*



analysts. In figure #1, the credit analysts overriding a scoring model rejected credit for many more customers with a score in the 1 to 3 range than were rejected by the validated credit policy results shown in figure 2. These rejections translate into lost sales. By the same token, the analysts approved slightly more accounts in the highest risk category (5) in figure #1 than were accepted with the validated credit policy (figure #2). These approvals translate into increased collection costs and bad debt expense. However, where the credit analyst's input was clearly validated was with the category 4 risk accounts. Using the scores as a guideline, the credit analysts were able to make a higher percentage of good decisions than would have been predicted by either the scores or the credit analysts separately.

The benefits from using credit scoring models within a validated credit policy are compelling. First

of all, the number of automated decisions is optimized. All customers who score above a validated threshold (typically set around the 40<sup>th</sup> percentile) are automatically approved without any additional credit analyst input. Likewise, accounts scoring in the lowest quadrant are denied open terms and so are redirected to alternative payment terms such as credit cards or cash-in-advance. The marginal scoring accounts that fall in-between are referred to a credit analyst (along with those few accounts for which there is not enough data to calculate a valid score). The second benefit, therefore, is significantly increased "good" decisions for this class of accounts. Furthermore, because the credit analysts are dealing with fewer accounts, most decisions can be made in a very short timeframe. In the leasing industry, companies that have implemented scoring models with a validated credit policy are setting the standard for response time on such accounts at 15 to 20 minutes or less. So while most, but not all, decisions are being made automatically, speed and quality are also being improved for those decisions that involve a credit analyst.



A final benefit is that validation makes it harder for the sales department to override credit decisions.

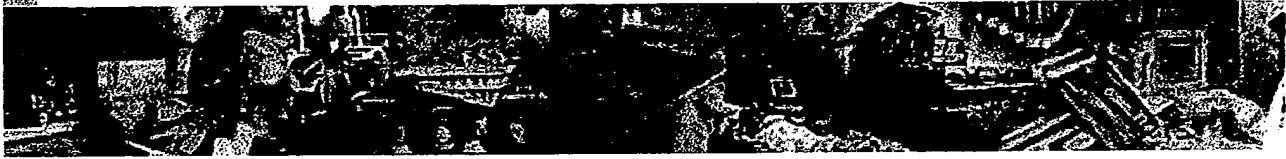
In effect, statistical validation provides the credit department with objective justification for their actions. Once credit policies have been validated, any effort to override carries a very high probability of potential loss. No longer can sales personnel criticize the credit department for biased decisions. Of course, failure to approve open credit does not mean flat-out rejection of the deal, but should prompt all parties involved to explore alternative terms for making the sale.

### **The Impact of Credit Scoring Models on the Credit Profession**

In the final analysis, finding a way to make a profitable sale should be the overriding goal of credit management. This is just as true for consumer credit as for commercial credit and as much for traditional businesses as for Internet enterprises. The purpose of credit management is not to avoid all risk, but to maximize profits. Toward that end, it is not surprising that a subjective approach to credit analysis will often fall short. While there have been skilled and experienced credit analysts who have consistently provided their employers with "good" decisions, the more people you have performing credit analysis and the higher the transaction volume per analyst, the more likely there will be inconsistent results and less than optimal performance. When it comes to e-commerce with its insistence on speedy decisions and its appetite for high transaction volumes, relying solely on the subjective abilities of individual credit analysts is not the answer. Nor will providing them with spreadsheet tools and written credit policies be sufficient to meet the challenge in a way that will achieve the dramatic improvements in performance that will be required.

The only viable alternative that can provide superior results while overcoming the twin challenges of speed and high transaction volumes is credit scoring models. Clearly, commercial credit scores provide vastly superior effectiveness and accuracy to that of manual systems. The opportunity this presents for the credit profession derives from the fact that scores provide optimal functionality within the context of a validated credit policy. Those credit managers who embrace scoring technology will realize greater influence over the sales approval process. However, those who resist the implementation of scoring technologies will find their influence within their organizations diminished.

*Michael Banasiak is President at Predictive Business Decision Systems. Predictive Business Decision Systems, Inc. (PBDS) is an independent statistical modeling, analysis, and consultation company that provides credit and marketing solutions to assist companies in making more profitable business-to-business decisions. Mr. Banasiak may be reached via e-mail at [mbanasiak@pbdsinc.com](mailto:mbanasiak@pbdsinc.com)*

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The only online source for commercial installment payment history information aggregated from the leading commercial lenders in the equipment finance and banking industries.

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## **What is the PAYNET™ Alliance?**

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The PAYNET™ Alliance is a group of commercial finance companies who confidentially contribute their customer payment experiences to a database managed by PAYNET™. In exchange, Alliance members get exclusive access to the only online, comprehensive database of lease payment history information available anywhere. The Alliance's cooperative approach, pioneered by PAYNET™, revolutionizes the delivery of information to the commercial finance industry.

### **Who May Belong to the PAYNET™ Alliance?**

Commercial Finance companies that want to make more informed credit decisions are invited to join. Participating companies must contribute their customer's payment history to become a member of the PAYNET™ alliance. By participating, commercial finance companies enjoy the network's enormous value proposition: unparalleled access to data for verifying the credit of customers and applicants.

**Important Note:** PAYNET™ ensures all data is secure. The data collected will never be used or sold for marketing purposes.

### **Why The PAYNET™ Alliance?**

Payment history experience has traditionally been verified by manually calling references provided by the lease applicant or by using a third party credit-reporting agency. This current process is costly, tips off competitors about a pending transaction, and provides an incomplete credit picture of the applicant.

The PAYNET™ Alliance's cost-effective payment information services provide subscribers with such benefits as:

- Increased approvals
- Lower credit losses and delinquencies
- Better information for deal pricing
- Streamlined credit process

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PAYNET, Inc. manages the "Payment Information Network" for the commercial equipment finance industry, an industry that represents more than \$550 billion in Net Assets. This network produces the nations' largest online, proprietary database of lease and loan payment history information used for credit decision purposes. The Payment Information Network currently has many leading commercial lenders as members, representing a substantial portion of the net assets in the industry. PAYNET, Inc. uses its proprietary technology and the power of shared data to increase profitability, to improve operational efficiency, and to reduce credit losses for commercial finance companies. Partners with PAYNET, Inc. include the Equipment Leasing Association, consulting firms and major lease accounting and software providers. Founded in 1999, the Company is headquartered in Skokie, Illinois.

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## Press Releases

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July 31, 2001

[PAYNET™ Launches Online Payment History Database](#)[Press Releases](#)

May 10, 2001

[In the News](#)[PAYNET™ Names Ned Buchman IT Director Former ThoughtWorks SVP Is E-Business Expert](#)[Privacy](#)

February 2, 2001

[PAYNET™ Announces Partnership with Statistical Scoring Firm, Predictive Business Decision Systems](#)

January 12, 2001

[PAYNET, Inc. Announces Addition to Board, Alan Matsumura, Partner and Founder of Diamond Technology Partners](#)

January 2, 2001

[PAYNET™ Announces Addition to Board, Thomas Butler, Former President and COO of Discover Credit Card](#)

October 23, 2000

[PAYNET™ Debuts Online Source for Lease Payment Histories, Major Lessors Sign Letters of Intent](#)

September 1, 2000

[PAYNET™ Introduces PAYNET™, the Only Online Source for Lease Payment Histories, Partnership with ELA Formed](#)

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**PAYNET™ Introduces PAYNET™,  
the Only Online Source for Lease Payment Histories**  
*Partnership with ELA Formed*

Northbrook, IL, September 1, 2000 -- PAYNET, Inc. announces a strategic partnership with the Equipment Leasing Association for the launch and marketing of its flagship service, Payment Information Network or PAYNET™, the only online service for commercial equipment leasing companies to obtain valuable lease payment history on lease applicants. The ELA-PAYNET™ agreement calls for ELA marketing support and visibility with the ELA membership.

"PAYNET™' partnership with The Equipment Leasing Association highlights the quality and integrity of the service," says Bill Phelan, President of PAYNET™. "The industry is in need of this network because, quite frankly, there is no better indicator of how a lease applicant will pay on his lease than how he is currently paying other leasing companies. PAYNET™ offers the critical credit variable and streamlines the credit process, allowing for higher transaction approvals and less write-offs through better informed credit decisions."

PAYNET™ will be demonstrated at the ELA convention this October in Palm Desert, California. The pilot program launches in 4th Quarter 2000, with an official launch set for early 2001.

"We are always looking for ways to help our leasing company members be more profitable," says ELA President Michael Fleming. "Credit is a key factor for lessor profitability, so our partnership with PAYNET™ allows us to support a system that will help companies achieve a more efficient and profitable credit process."

"ELA's involvement also ensures that the largest number of lessors are introduced to PAYNET™, recognize its value and participate," says Fleming. "Companies contributing their credit data helps not only the entire industry make better informed credit decisions," he notes. "But ultimately helps the quality of the leasing community including their individual companies."

Leasing company subscribers to PAYNET™ will provide a monthly download of their customers' lease payment experiences to PAYNET™. A one-time technological set-up is required, but thereafter the monthly downloads will be handled automatically through their existing accounting system ensuring that minimal staff time and technological resources are required. PAYNET™ subscribers then can access the pooled data and pull Payment History Reports online for a low fee per report. For confidentiality

reasons, names of leasing companies will not be associated with published credit data. This PAYNET™ data also will not be sold for marketing purposes.

Ultimately, subscribers to PAYNET™ can:

- \* Have access to data that supports more informed credit decisions, increased approvals, lower delinquencies and write-offs;
- \* Obtain data that is more relevant to their credit decisions than traditional sources of credit history;
- \* Receive accurate, quality information due to PAYNET™' data filtering process;
- \* Enjoy a streamlined credit process; and
- \* Eliminate the credit process of checking references with competitors, therefore tipping off the competition to pending deals.

PAYNET™ is working with The Revere Group, as well as Northern Consulting, CEO Associates, and major accounting and software providers to ensure that PAYNET™ technology is user friendly and compatible with existing lease accounting systems.

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### **About PAYNET, Inc.**

PAYNET, Inc manages the "Payment Information Network" for the commercial equipment finance industry, an industry that represents more than \$550 billion in Net Assets. This network produces the nations' largest online, proprietary database of lease and loan payment history information used for credit decision purposes. The Payment Information Network currently has many leading commercial lenders as members, representing a substantial portion of the net assets in the industry. PAYNET, Inc uses its proprietary technology and the power of shared data to increase profitability, to improve operational efficiency, and to reduce credit losses for commercial finance companies. Partners with PAYNET, Inc include the Equipment Leasing Association, consulting firms and major lease accounting and software providers. Founded in 1999, the Company is headquartered in Skokie, Illinois. For more information, visit the PAYNET, Inc web site at [www.paynetonline.com](http://www.paynetonline.com).

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[www.paynetonline.com](http://www.paynetonline.com)

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## **PAYNET™ Debuts Online Source for Lease Payment Histories**

[Press Releases](#)

### ***Major Lessors Sign Letters of Intent***

[In the News](#)[Privacy](#)

Palm Desert, California, October 23, 2000 -- Today PAYNET, Inc. announces the first public demonstration of its flagship service, the PAYNET™ Alliance - a network of commercial finance companies contributing their lease payment history on applicants to an online database - at the ELA Convention being held this week in Palm Desert, California. In exchange, companies participating in the Alliance gain access to PAYNET™' proprietary information services. Several major lessors have signed letters of intent.

"We provide clients with a complete integrated solution for the credit operation," says Bill Phelan, President of PAYNET™, Northbrook, Illinois. "Most leasing companies could improve their credit processes, which keeps them from profiting as they should. Participating in the PAYNET™ Alliance gives lessors access to a broad universe of relevant credit information."

Several major commercial equipment finance companies have signed letters of intent. A partial list includes: Navistar Leasing Company (Rolling Meadows, Illinois) Volvo Commercial Finance LLC (Greensboro, North Carolina); Textron Financial Corp. (Providence); Key Equipment Finance Group (Superior, Colorado); De Lage Landén Financial Services, Inc. (Berwyn, Pennsylvania); Firststar Equipment Finance (St. Louis Park, Minnesota); GreatAmerica Leasing Corp. (Cedar Rapids, Iowa); Farm Credit Leasing Services Corp. (Minneapolis); Pitney Bowes Financial Services (Shelton, Connecticut); and Irwin Business Finance Corp. (Bellevue, Washington).

Leasing companies participating in the PAYNET™ Alliance will provide a monthly download of their customers' lease payment experiences to PAYNET™. A one-time technological set-up is required, but thereafter the monthly downloads will be handled automatically ensuring that minimal staff time and technological resources are required. PAYNET™ subscribers may access the pooled data and pull Payment History Reports online for a low fee per report. Downloads directly into lessors' credit scoring systems also are available.

For confidentiality reasons, names of leasing companies will not be associated with published credit data. Also, PAYNET™ data will not be sold for marketing purposes.

Ultimately, subscribers to PAYNET™ can:

- ✧ Have access to data that supports more informed credit decisions, increased approvals, lower delinquencies and write-offs;
- ✧ Obtain data that is more relevant to their credit decisions than traditional sources of credit history;
- ✧ Receive accurate, quality information due to PAYNET™ data filtering process;
- ✧ Enjoy a streamlined credit process; and
- ✧ Eliminate the credit process of checking references with competitors, therefore tipping off the competition to pending deals.

"Low market valuations in the leasing industry highlight the need for PAYNET™, which will ultimately help the viability of the industry through more informed decision-making," says PAYNET™ Chairman Dan Michalek. "Ultimately, PAYNET™ turns credit uncertainty into credit clarity, and inefficiencies into profitability."

PAYNET™ is working with The Revere Group, as well as Northern Consulting, CEO Associates, and major accounting and software providers to ensure that PAYNET™ technology is user friendly and compatible with existing lease accounting systems.

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